FA-PC VPC Series

VPC-2000
User's Manual

CONTEC CO.,LTD.

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Chapter 1 Introduction

About the Product

The VPC-2000 series is a BTO industrial PC that is equipped with either an Intel® Core i7 860 (2.8GHz), Core i5 660 (3.33GHz), or Pentium G6950 (2.8GHz). The Intel® Q57 chipset with DDR3 memory (2GB or 4GB) provides a system with extreme computing and graphics performance. These products feature a variety of interfaces, including 8 USB ports (Front: 2, Rear: 6), 2 1000BASE-T ports, 1 RS-232c port and 1 parallel port. These units are ideal for a wide range of embedded applications, such as control devices and information terminals based on general-purpose PC OSes. This series provides carefree use under harsh working conditions such as FA, achieving superb environmental resistance and a long-term stable supply due to careful selection of parts such as embedded CPUs and chipsets.

This product is available in the following 1 model.

<Base Model>

VPC-2000 Black

<Standard Model>

Model name	CPU	Memory	HDD	Optics system drive	OS
VPC-2000-16200B	Intel Pentium G6950	Memory 2GB	SATA 250GB	DVD Multi drive	None
VPC-2000-16222B					Windows XP Professional (Japanese)
VPC-2000-36222B	Intel Core i5 660				
VPC-2000-37225B					Windows 7 Professional (Japanese)
VPC-2000-47225B	Intel Core i7 860				

◆Basic performance

- **Intel® Core i7 is installed** (※Core i7 Model)
  Embedding a high-performance CPU, the VPC-2000 series has achieved lower prices.
- **Intel® Q57 Chipset is adopted**
  Employing an embedded-style chipset, the VPC-2000 series has achieved a long-term stable supply.
- **It Corresponds to mirroring(RAID1)**
  The construction of the mirroring becomes possible and the system can be made tedious.
  [Software RAID]
  It is possible to have software mirroring configuration. However, it can not hot-swap.
  [Hardware RAID]
  Because option：Mirror card is choiced, it is possible to have Hardware mirroring configurations. This can hot-swap.
- **Suitable chassis for embedded applications**
  Taking advantage of our rich experience, the VPC-2000 series is designed with optimization for heat dissipation, operating vibration dampening and consideration for scalability.
- **Supports high-speed high-capacity memory**
  The VPC-2000 series supports DDR3 SDRAM DIMM modules (2GB or 4GB) designed for high-speed transfer speed, flexibly addressing memory-consuming applications such as image processing.

◆Commodity model

VPC-2000 model rule

・**Model name**

VPC-2000

・**Type name**

S	3	6	0	1	B	1	2	0	0	0	X	X		X	X
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬		⑭	⑮

① Power-supply
- S : Standard specification (Made in foreign countries)

② CPU
- 1 : Pentium G6950
- 3 : Core i5 660
- 4 : Core i7 860

③ Memory
- 6 : PC3-10600 DDR3 2GB(2GB×1)
- 7 : PC3-10600 DDR3 4GB(2GB×2)

④ VGA
- 0 : None
- 1 : AD-8001(AMD M72)

⑤ Hard disk (SATA1)
- 0 : None
- 1 : 250GB 3.5inch HDD(SATA)
- B : 2TB 3.5inch HDD(SATA)

⑥ Hard disk (SATA2)
- 0 : None
- 1 : 250GB 3.5inch HDD(SATA)
- B : 2TB 3.5inch HDD(SATA)

⑦ Optics system drive
- 0 : None
- 1 : DVD-Multi drive

⑧ RAID (Mirroring)
- 0 : None
- R : Software RAID
- H : Hardware RAID

⑨ Operating system
- 0 : None
- 2 : Windows XP Professional (JPN)
- 4 : Windows 7 Professional (JPN)
- B : Windows XP Pfofessional (ENU/JPN/CHS)
- D : Windows 7 Professional (ENU)

⑩ Keyboard
- 0 : None
- 1 : Japanese 109 keyboard (PS/2)
- A : English 104 keyboard (PS/2)

⑪ Mouse
- 0 : None
- 1 : Mouse (PS/2)

⑫ Onsite Maintenance Service
- 0 : None
- 2 : Onsite maintenance service of two ye
- 3 : Onsite maintenance service of three

⑬ X:Reserve
⑭ X:Reserve
⑮ X:Reserve

◆Supported OS

- Windows XP Professional
- Windows 7 Professional

Customer support

CONTEC provides the following support services for you to use CONTEC products more efficiently and
comfortably.

◆Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

■Latest product information

CONTEC provides up-to-date information on products.
CONTEC also provides product manuals and various technical documents in the PDF.

■Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price,
delivery time, or estimate information.

◆Limited One-Year Warranty

CONTEC products are warranted by CONTEC CO., LTD. to be free from defects in material and
workmanship for up to one year from the date of purchase by the original purchaser.
Repair will be free of charge only when this device is returned freight prepaid with a copy of the original
invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from
which it was purchased.
This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and
original products. The warranty is not applicable if the device has been tampered with or damaged
through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in
which case repairs will be considered beyond the warranty policy.

◆How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please
obtain a Return Merchandise Authorization number (RMA) from the CONTEC group office where you
purchased before returning any product.
* No product will be accepted by CONTEC group without the RMA number.

◆Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor
be liable for any incidental or consequential damages due to such defect or consequences that arise from
inexperienced usage, misuse, or malfunction of this device.

Safety precaution

Understand the following definitions and precautions to use the product safely.

◆Safety infomation

This document provides safety information using the following symbols to prevent accidents resulting in
injury or death and the destruction of equipment and resources. Understand the meanings of these labels
to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

◆Handling precautions

CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

- Do not use or store the product in a location exposed to extremely high or low temperature or susceptible to rapid temperature changes.
  Example ・Exposure to direct sun
  ・In the vicinity of a heat source
- Do not use the product in extremely humid or dusty locations. It is extremely dangerous to use the product with its interior penetrated by water or any other fluid or conductive dust. If the product must be used in such an environment, install it on a dust-proof control panel, for example.
- Avoid using or storing the device in locations subject to shock or vibration.
- Do not use the product in the vicinity of devices that generate strong magnetic force or noise. Such devices will cause this device to malfunction.
- Do not use or store the product in the presence of chemicals.
- To clean, wipe it gently with a soft cloth dampened with either water or mild detergent. Do not use chemicals or a volatile solvent, such as benzene or thinner, to prevent pealing, discoloration of the paint, or deterioration of resin.
- As continuous operation of the equipment may shorten the life of the hard disk drive, use it in stand-by mode.
- Be sure to unplug the power cable from a wall outlet before plugging or unplugging a extension board or any connector.
- CONTEC reserves the right to refuse to service a product modified by the user.
- In the event of failure or abnormality (foul smells or excessive heat generation), unplug the power cord immediately and contact your retailer.
- Use an AC cable suitable for your supply voltage and outlet/plug. (The supplied cable is for 125V AC.
- The hard disk must be replaced when the power of the main unit is off. It is not hot-swappable. Removing the hard disk during operation may damage the system.
  (However, hardware raid is excluded.)
- Component Life:
  (1)Power·····During continuous operation at 40℃, the assumed life is about four years (vertical installation). However, it may be shortened due to operating temperature (high temperatures).
  (2)Battery·····The internal calendar clock and CMOS RAM are backed by a Lithium primary battery. The backup time at a temperature of 25° C with the power disconnected is 10 years or more.
  (3)Chassis FAN···During operation at 40℃, the assumed life is about six years. However, it may be shortened due to operating temperature.
  * Replacement of expendables is handled as a repair (there will be a charge).
- To connect with peripherals, use a grounded, shielded cable.
- Do not use a UPS (uninterruptible power supply) with square-wave output, as connecting it may damage the system.
- Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- Abandon a used battery appropriately according to the instruction of the municipality.

VCCI Class A and FCC PART 15 Class A Notice
FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

VCCI Class A Notice

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

⚠CAUTION

The object of the standard of this product becomes only a main body.

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⚠CAUTION

The latest version manual downloads from CONTEC web site.

Chapter 2 About the product

Specification

Functional specification

System Specification	
CPU※1	・Intel Core i7 860 ※2---------- 2.8GHz ・Intel Core i5 660 ---------- 3.33GHz ・Intel Pentium G6950 ---------- 2.8GHz
Chipset	Intel Q57
BIOS	AMI BIOS
Memory※1	2048MB (1024MB×2) , 4096MB (1024MB×4) (DDR3 SDRAM DIMM)
Hard disk drive※1	・SATAⅡ 3.5" HDD 250GB/2TB (Software/Hardware)RAID1 ・SATAⅡ 3.5" HDD 250GB/2TB ×1 or ×2
Optical drive	DVD super multi drive Max. reading speed DVD-ROM x16, CD-ROM x48 Max. writing speed DVD+/-R x24, DVD+RW x8, DVD-RW x6, DVD+/-R-DL x12, DVD-RAM x12, CD-R x48, CD-RW x32
VGA	Digital DVI-D 29Pin,Analog RGB(D-SUB 15Pin)
USB port	Front 2 port Rear 6 port
PS/2 port	2 port (Keyboard/Mouse)
Audio	HDAC/ALC888 CODEC (7.1+2CH audio codec) (Mike input, Line input, Line output)
Sirial	COM1,2 (RS-232C) D-SUB 9pin×2 COM3,4 (RS-232C) ※3
Parallel	D-SUB 25pin×1
LAN port	10BASE-T/100BASE-TX/1000BASE-T RJ45×2
LAN Controller	Intel 82578DM Gigabit Ethernet Intel 82583V Gigabit Ethernet
Degital I/O	Front：LED output x2 Rear：output x2、Input x4 (Software API support、User application)
RAS function	WDT：1sec～255sec (Resetting operation by end) Remote reset／Remote power on External input signal Software RAS function (Fan rotation、temperature、Voltage data reading)
Extended slot	PCI Express x16 (Max:176mm(L)×110mm(H)) ※4：1slot PCI Express x4 (Max:176mm(L)×110mm(H)) ：1slot PCI (Max:176mm(L)×110mm(H)) ：2slot
OS※1	・Windows XP Professional (32bit) JPN ・Windows XP Professional (32bit) [ENU/JPN/CHS] ・Windows 7 Professional (32bit) JPN ・Windows 7 Professional (32bit) ENU
Stand	Wall mount
Physical dimensions(mm) ／Weight	370(W) x 470(D) x 166(H) (No protrusions) ／About 14Kg ※5
Power	400W ATX Power (100-240VAC(50-60Hz) Automatic input switch)

※1 Implement and install the options you selected.

※2 DVI-I and A-RGB of onboard can not use when you ware selected the Core i7 860. The Graphic board is installed when the Core i7 860 is installed.

※3 The connector of the D-SUB 9 pin is output from the back of the chassis.

※4 The PCI Express ×16 slot is monopolized when the graphic board is installed on the Core i7 860.

※5 Only the weight of the main unit. Appended goods and the packing box are excluded.
※6 When using EAD(LPCI)SF and EAD(PCI)SF, set the JP1 to short 2-3.
EAD(LPCI)SF and EAD(PCI)SF may not function normally otherwise.

Ambient specification

Operating temperature／humidity		5～40℃／20～80%RH (No condensation)
Storage temperature／humidity		-20℃～60℃／5～80%RH (No condensation)
Floating dust particles／Corrosive gases		Not to be excessive／None
Line-noise resistance	Static electricity resistance	Contact discharge ／±4KV(EN61000-4-2Level2,IEC1000-4-2 Level2 Atmospheric discharge ／±8KV(EN61000-4-2Level3,IEC1000-4-2 Level3
	Line noise	AC line／2KV,Signal line／1KV (EN61000-4-4Level3,IEC1000-4-4Level3)
Vibration resistance	Sweep resistance	10～57Hz／semi-amplitude 0.015m 57～150Hz／0.2G 40 min each X,Y, and Z directions (JIS C0040 compliant、IEC68-2-6 compliant)
Impact resistance		10G, half-sine shock for 11 ms in X,Y, and Z directions (JIS C0041 compliant, IEC68-2-27 compliant)
Standard		RoHS EMC (EN55022、EN61000-6-2) and LVD (EN60950-1)

(注) Do not use under environmental conditions beyond normal specifications. The system may malfunction.

Option Mirror card specification

Item	Specification
Number of connected drivers	2
RAID level	1
Storage capacity	Max. 2TB
Cache memory size	1MB
Host interface	S-ATA Max. data transfer rate：3Gbps
Drive interface	S-ATA Max. data transfer rate：3Gbps
Range of power-supply voltage	4.75VDC～5.25VDC
Current consumption	1.0A
Physical dimensions (L×W)	96mm × 98.2mm
Weight	42g (max.)

Option Graphic board specification

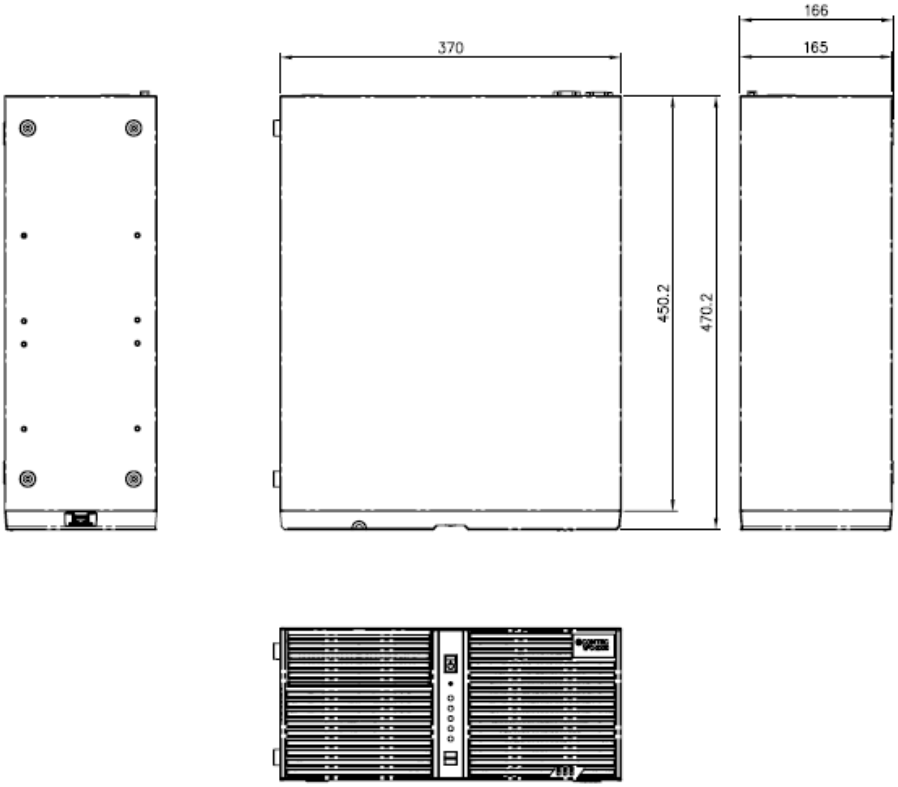
Item	Specification
GPU	AMD M72-CSP128
Graphics memory	128MBH DDR3 on chip (2pcs of 16M×32bit)
Connector	A-RGB/DVI-I,A-RGB,TV-out
Maximum display abuility	2048×1536 , 85Hz
Physical dimensions (L×W)	167.6mm × 68.9mm

⚠CAUTION

The screen in the following display connection of power supply ON cannot be displayed. Please turn on the power supply after connecting the display.

Physical dimensions

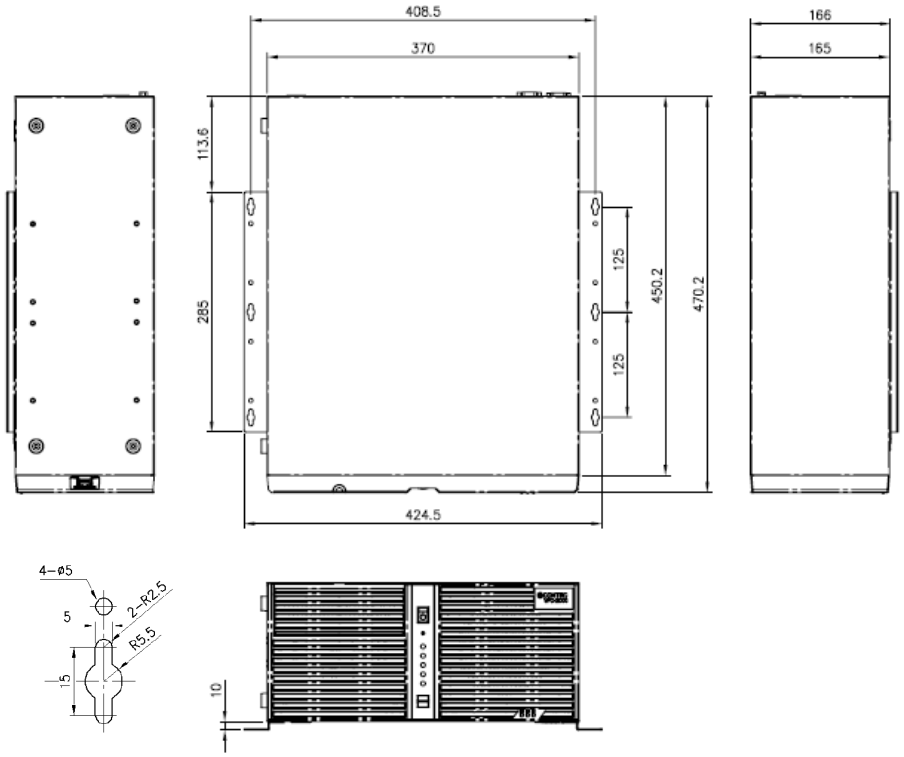
VPC-2000



[mm]

Figure 2.1 VPC-2000

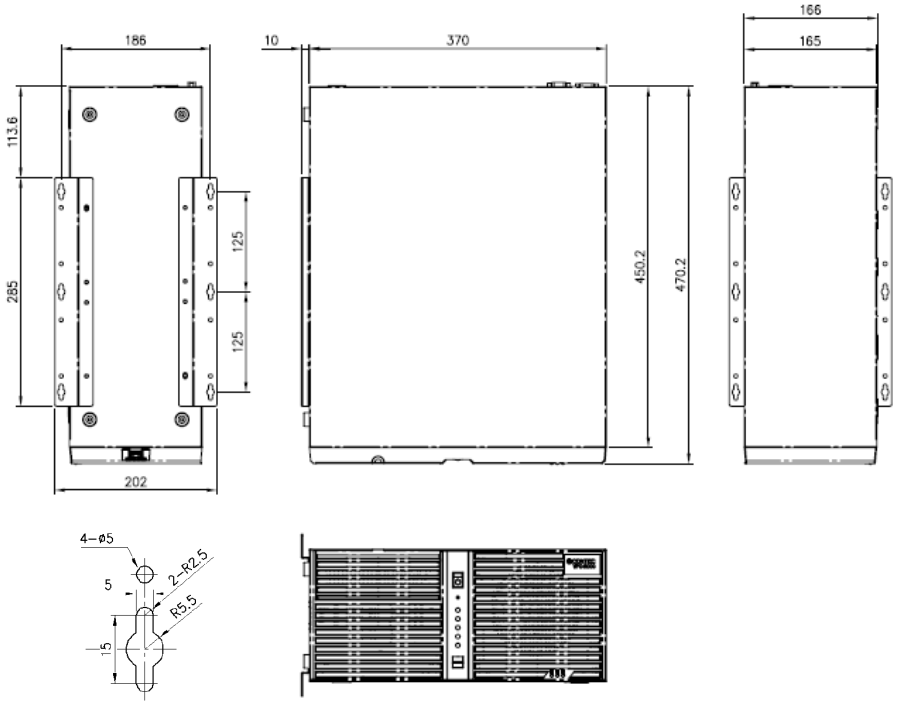
At installation the wall mount stand of VPC-2000 (horizontal installation)



[mm]

Figure 2.2 At installation the wall mount stand of VPC-2000 (horizontal installation)

At installation the wall mount stand of VPC-2000 (Vertical installation)



[mm]

Figure 2.3 At installation the wall mount stand of VPC-2000 (Vertical installation)

Motherboard Block chart

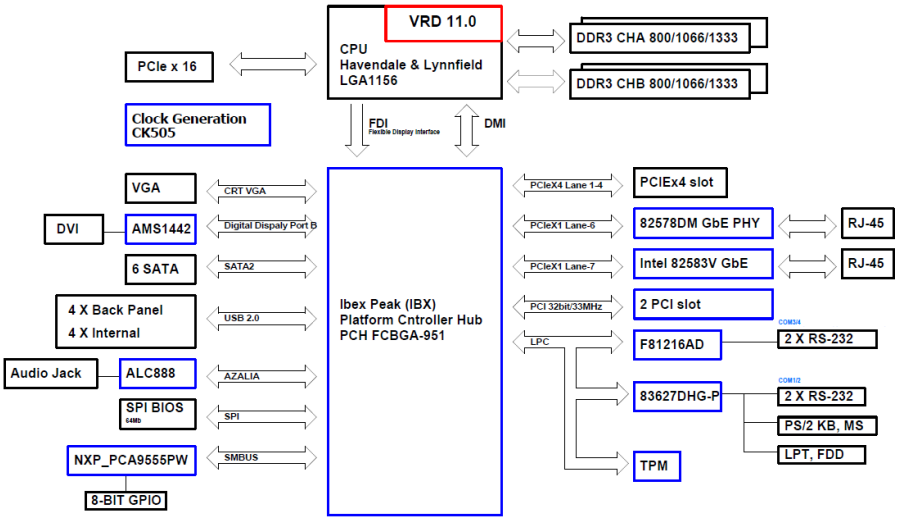


Figure 2.4 Motherboard Block chart

Keyboard specification

Item	Specification
Key array	Japanese 109 key, English 104 key
Key switch	Membrane switch
Connector	USB (PS/2 Conversion connector attachment)
Length of cable(mm)	1500mm ～ 1700mm

⚠CAUTION

It becomes optional of VPC-2000 in the keyboard.

Please inquire details like the specification etc. of the keyboard separately.

Moreover, the above-mentioned keyboard becomes a standard off the subject.

Mouse specification

Item		Specification
Electrical specification	Operation voltage	DC +5V (±0.5V)
Physical specification	Interface (Connector)	PS/2 (mini-DIN6pin male)
	Body color	White
	Button	3 Piece (One piece on the insideisa wheel.)
	Number of wheels	1 Piece
	Length of cable	1830mm ～ 1850mm
	Physical dimensions (H x D x W)	39.5mm x 117mm x 62.1mm
Tracking	Resolution	460dpi
Environment specification	Dustproof/Waterproof/Dripproof	Non-correspondence

⚠CAUTION

It becomes optional of VPC-2000 in the mouse.

Please inquire details like the specification etc. of the mouse separately.

Moreover, the above-mentioned mouse becomes a standard off the subject.

Chapter 3 Hardware setup

Before Using the VPC-2000 for the First Time

Follow the next steps to set up the VPC-2000.

STEP1 Install Hard disk, Memory (DIMM) packaging, CD-ROM, DVD Multi drive packaging, and set Jumper switches.
By referring to the information in this chapter, set the VPC-2000.

STEP2 Connect cables.
Connect the cable of necessary external devices, such as Printer and display, to this product using appropriate cables.

STEP3 Tuen on the Power
After venifying that you have correctly steps 1 and 2, turn on the power. If you find any abnormality after turning on the power, turn it off and check to see if the setup has been performed properly.

STEP4 BIOS Setup
By referring to Chapter 4, setup BIOS. This setup requires a keyboard and a display.

※ Before using the VPC-2000, be sure to execute “Load Optimal Defaults” to initialize the BIOS settings to their default values.
(See Chapter 4, “Exit tab”.)

⚠CAUTION

If your VPC-2000 is a Windows preinstalled model, be sure to connect the keyboard and mouse to it before turning the poer on for the first time.

Hardware setup

- Before you start, be sure that the power is turned off.
- For internal hard disk models, ensure that physical jolts are avoided.
- Remove only those screws that are explained. Do not move any other screw.

◆Removing the top cover and drive bay

(1) Remove the top cover.

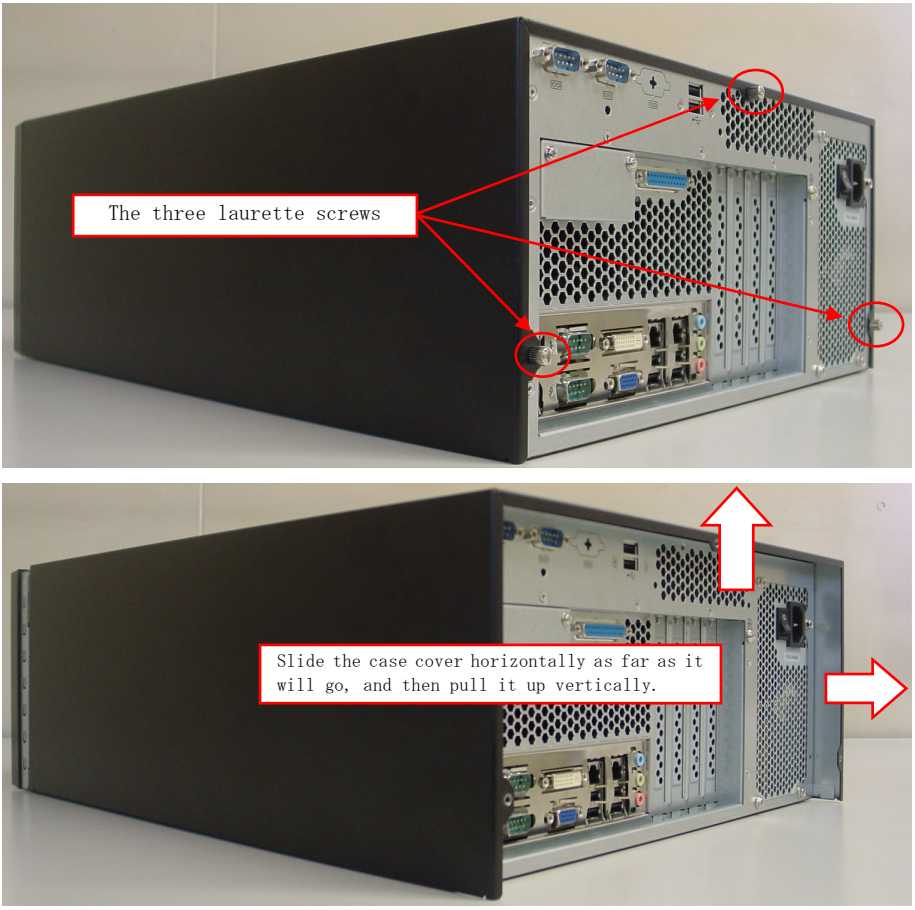


Figure 3.1 Removing the top cover

(2) Open the Front Cover.

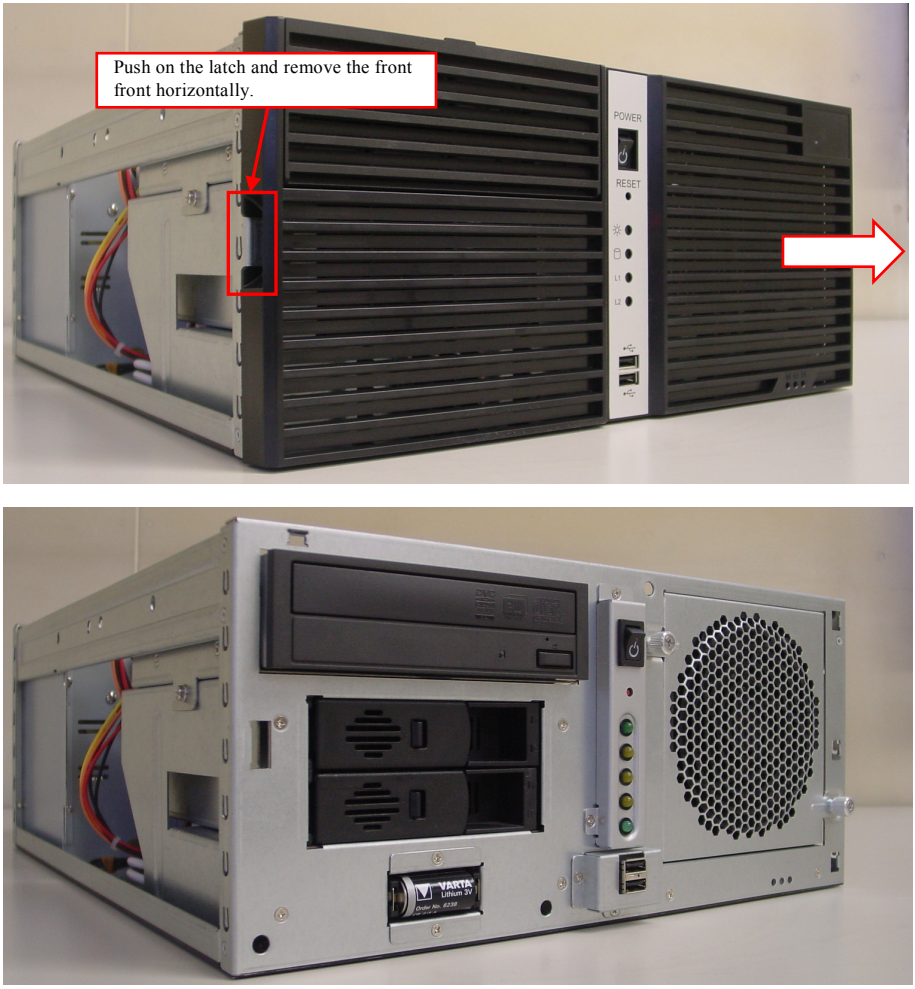


Figure 3.2 Opening the front cover

CAUTION

When you install/remove a front bezel, take sufficient care to avoid contact with the front LED.

Contact may damage the front LED.

(3) After remove four screws, the bracket for the extension board.

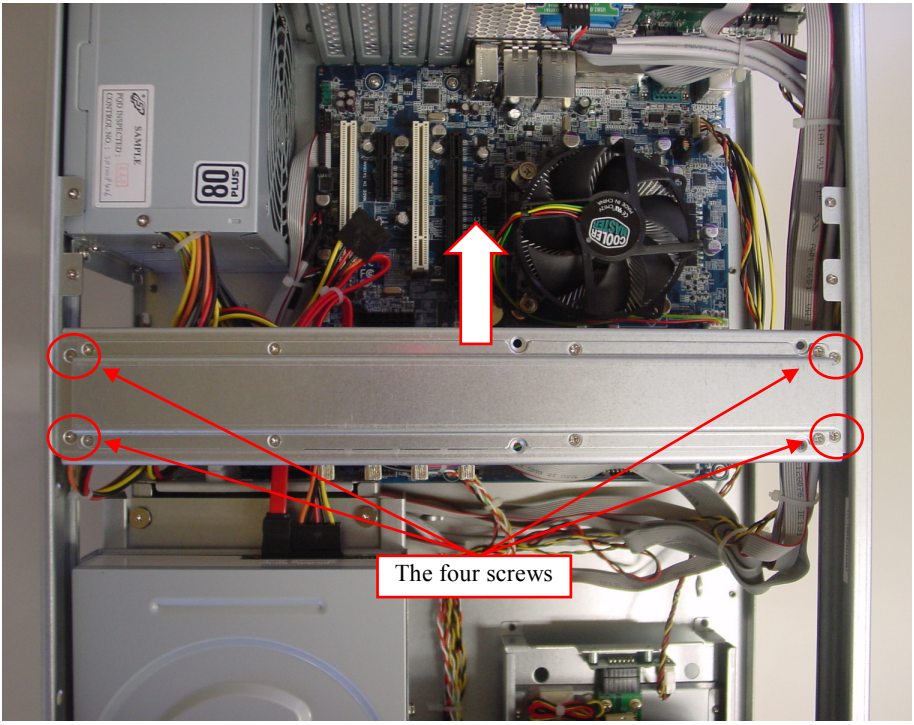


Figure 3.3 Removing the extension board bracket

◆Locations and settings of internal connectors and jumpers

Once you have removed the case cover, the bracket for the extension board, and the drive bay unit, you will be able to see the connectors and jumpers as illustrated below.

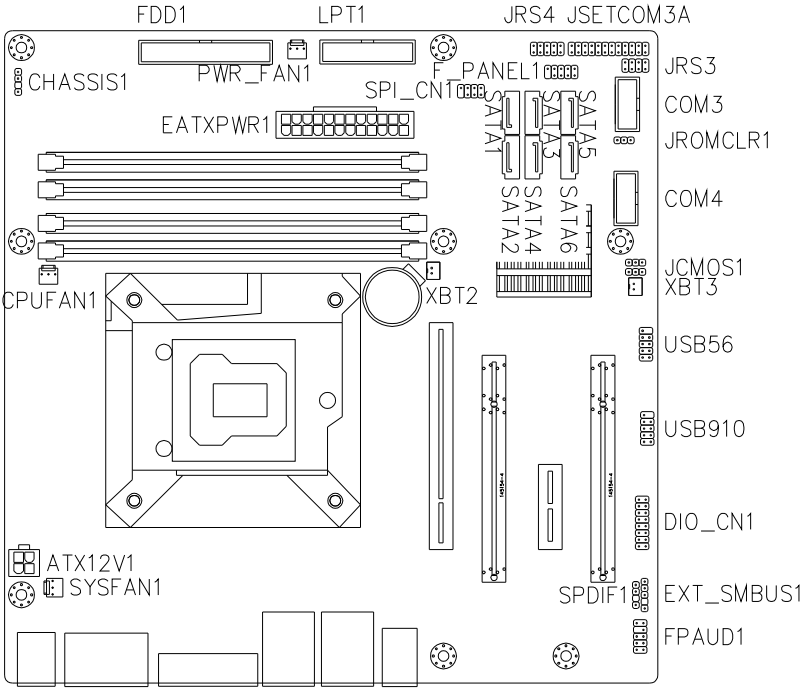


Figure 3.4 Locations and setting of jumpers and connectors inside the top cover

Table 3.1 Jumper setting

Name	Function	Factory Setting	Reference page	Remarks
JCOMS1	CMOS clear setting	1-2 Short	P21	State usually
JMECLR1	JMECLR1 setting	1-2 Short	P21	※1
JROMCLR1	ROM clear setting	1-2 Short	P22	State usually
JSETCOM3	COM3 port setting (RS-232C)	2-4, 3-5, 810, 9-11, 14-16, 15-17, 20-22, 21-23 Short	P22	※1
JRS3	COM3 Terminator	Open	P23	※1
JRS4	JRS4 setting	1-2 Short	P22	※1

※1 Use the factory default settings.

Table 3.2 Connector setting

Name	Function	Reference page	Name	Function	Reference page
FPAUD1	※2	-	EXT_SMBUS1	※2	-
SPDIF1	※2	-	DIO_CN1	Degital I/O connector	P26, 72
USB910	USB9, 10 connector	P27, 70	USB56	USB5, 6 connector	P27, 70
XBT2	Battery connector	-	XBT3	+5V dual voltage connector	-
CON3/4	Serial connector	P29, 66	SATA1-6	Serial ATA 1/2/3/4/5/6 connector	P. 76
F_PANEL1	Front panel connector	P28	SPI_CN1	※2	-
EATXPWR1	ATX24pin power-supply connector	P24	LPT1	Parallel port connector	P. 69
PWR_FAN1	※2	-	FDD1	Floppy disk connector	P. 75
CHASSIS1	※2	-	CPU_FAN1	CPU fan connector	P. 25
ATX12V1	ATX 12V power-supply connector	P24	SYS_FAN1	System fan connector	P. 25

※2 Please do not use it.

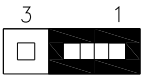
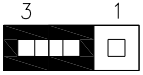
※3 This connector is output through wires connected to the chassis. For details, see pages 63 and 64.

◆Jumper setting

■CMOS clear setting : JCMOS1

CMOS Clear will reset the contents of the CMOS to initial BIOS values. Clearing the CMOS will not reset the clock.

Table 3.3 CMOS clear setting

JCMOS1	Function
	State usually (Factory default setting)
	CMOS clear

⚠CAUTION

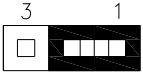
Always set CMOS Clear with the AC cable unplugged, and before reconnecting the power, restore it to its normal setting.

Clearing the CMOS while the power is connected may damage the board.

■JMECLR1

Use the factory default settings.

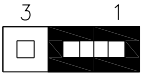
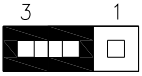
Table 3.4 JMECLR1 setting

JMECLR1	Function
	State usually (Factory default setting)

■ROM clear setting : JROMCLR1

It is possible to start by invalidating the BIOS setting because pin 2 and pin 3 are shorted and the system is started. If the system doesn't start, please try this setting. Please set the CMOS again when the system starts.

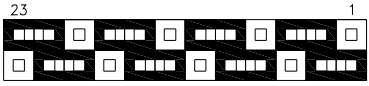
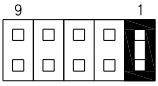
Table 3.5 ROM clear setting

JROMCLR1	Function
	State usually (Factory default setting)
	ROM clear

■COM3 port setting : JSETCOM3 JRS4

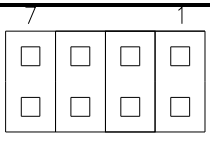
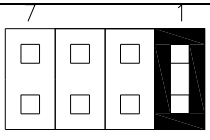
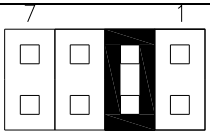
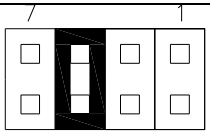
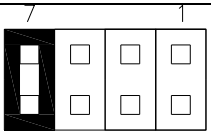
JSETCOM3 and JRS4 change the communication setting for com3 port. RS-232C is the factory default setting.

Table 3.6 COM3 setting : JSETCOM3 JRS4

JSETCOM3	JRS4	Function
		RS-232C (Factory default setting)

■COM3 RS-232C/485 terminator : JRS3

Table 3.7 COM3 terminator setting : JRS3

JRS3	終端抵抗	機能
	None	State usually (Factory default setting)
	It is	CTS
	It is	RTS
	It is	RXD
	It is	TXD

◆Mother board internal connector

■ATX power-supply connector: EATXPWR1/ATX12V1

Connect the ATX power connector, observing the correct orientation.

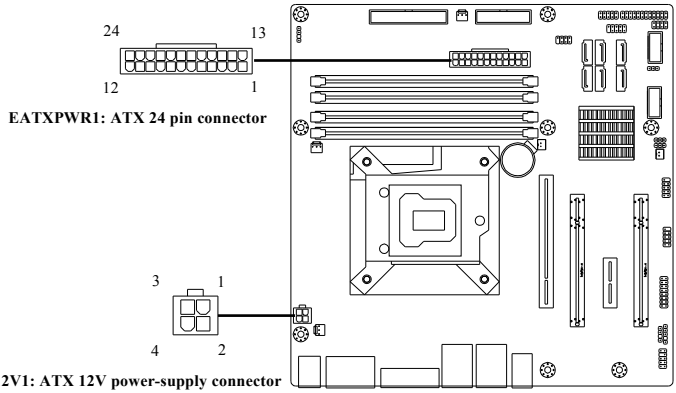


Figure 3.5 ATX power-supply connector

Table 3.7 EATXPWR1

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PW_OK	20	NC
9	5V_SB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 3.8 ATX12V1

PIN	SIGNAL
1	+12V
2	GND
3	+12V
4	GND

⚠CAUTION

Both EATXPWR1 and ATX12V1 are absolutely necessary power supplies for operation. Turning on the power for only one of these may damage the system.

■Fan power supply connector: CPU_FAN1/SYS_FAN1

Connectors for connecting a cooling fan.

A fan with a speed sensor can be used.

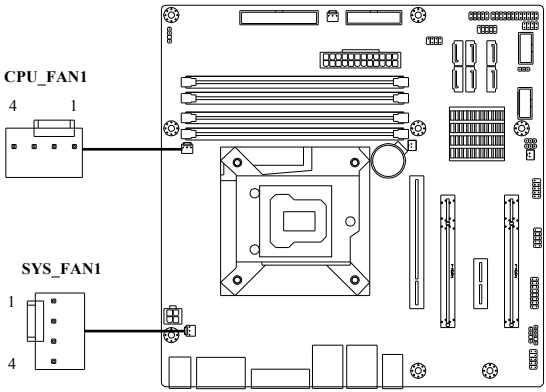


Figure 3.6 Fan power supply connector

Table 3.9 CPU_FAN1/SYS_FAN1

PIN	SIGNAL
1	GND
2	+12V
3	SENSOR
4	CONTROL

■Digital I/O connector：DIO_CN1

This connects to the digital I/O connector at the rear of the main unit.

For details, refer to Chapter 5 ”Functions of Each Unit” - “Digital I/O Interface”.

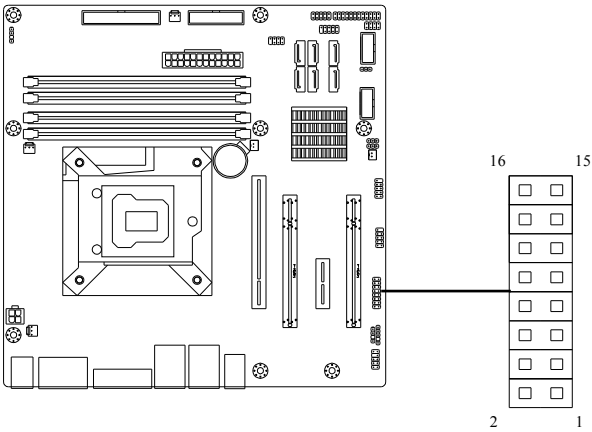


Figure 3.7 Digital I/O connector

Table 3.10 DIO_CN1

PIN	SIGNAL	PIN	SIGNAL
1	+5V	9	I3
2	+12V	10	O3
3	I0	11	GND
4	O0	12	GND
5	I1	13	SYS_RESET
6	O1	14	GND
7	I2	15	PWRBTN_IN
8	O2	16	NC

■Internal USB connector: USB5,6/USB9,10

Connectors for connecting the USB connector on the front panel of the case with an USB extension bracket.
For the VPC-2000 series, the bracket is already connected to the USB connector on the front panel by a special cable.

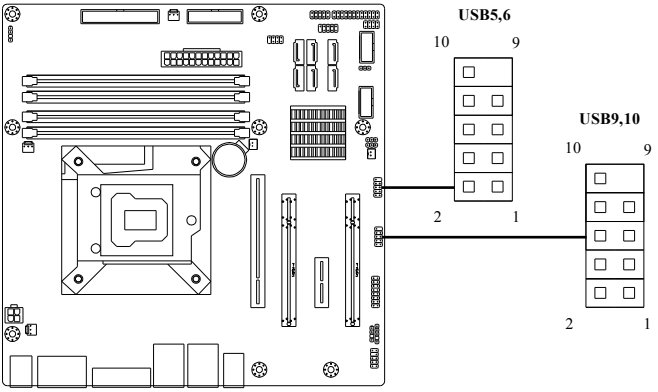


Figure 3.8 Internal USB Connector

Table 3.11 USB5,6/USB9,10

PIN	SIGNAL	PIN	SIGNAL
1	+5V	6	USB(6or10) +Data
2	+5V	7	GND
3	USB(5or9) -Data	8	GND
4	USB(6or10) -Data	9	Key (No Pin)
5	USB(5or9) +Data	10	NC

■Front panel connector: F_PANEL1

A connector for connecting the power switch, reset switch, power LED, HDD LED, etc. at the front of the case.

For the VPC-2000 series, they are already connected on the front by a special cable.

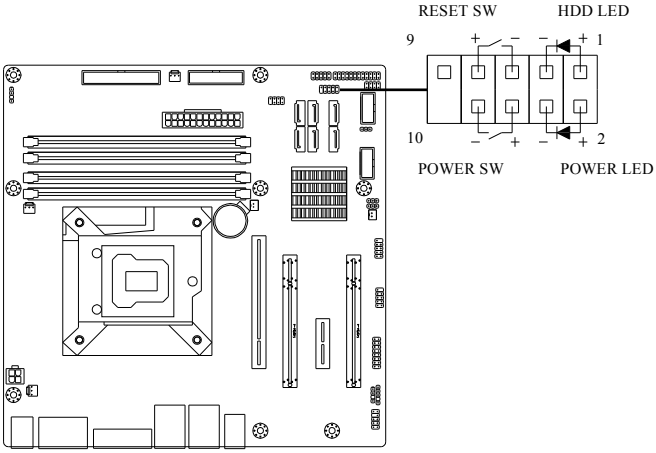


Figure 3.9 Internal front panel connector

Table 3.12 F_PANEL1

PIN	SIGNAL	PIN	SIGNAL
1	HDD LED+	6	POWER+
2	PWLED+	7	RESET+
3	HDD LED-	8	GND
4	GND	9	NC
5	GND	10	Key (No Pin)

■COM port connector: COM3/COM4

These are connected to the COM3 and COM4 connectors at the rear of the main unit.

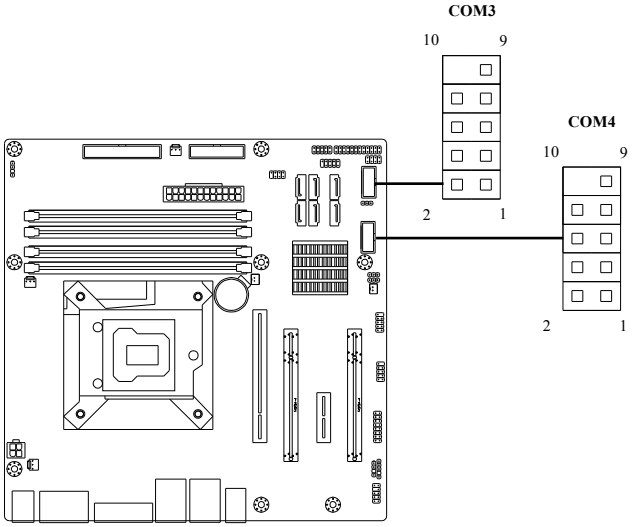


Figure 3.10 COM port connector

Table 3.13 COM3

RS-232C			
PIN	SIGNAL	PIN	SIGNAL
1	DCD	6	CTS
2	DSR	7	DTR
3	SIN	8	RI
4	RTS	9	GND
5	SOUT	10	Key (No Pin)

Table 3.14 COM4

PIN	SIGNAL	PIN	SIGNAL
1	DCD	6	CTS
2	DSR	7	DTR
3	SIN	8	RI
4	RTS	9	GND
5	SOUT	10	Key (No Pin)

◆Attaching the hard disk

(1) Remove the removable case from the drive bay.

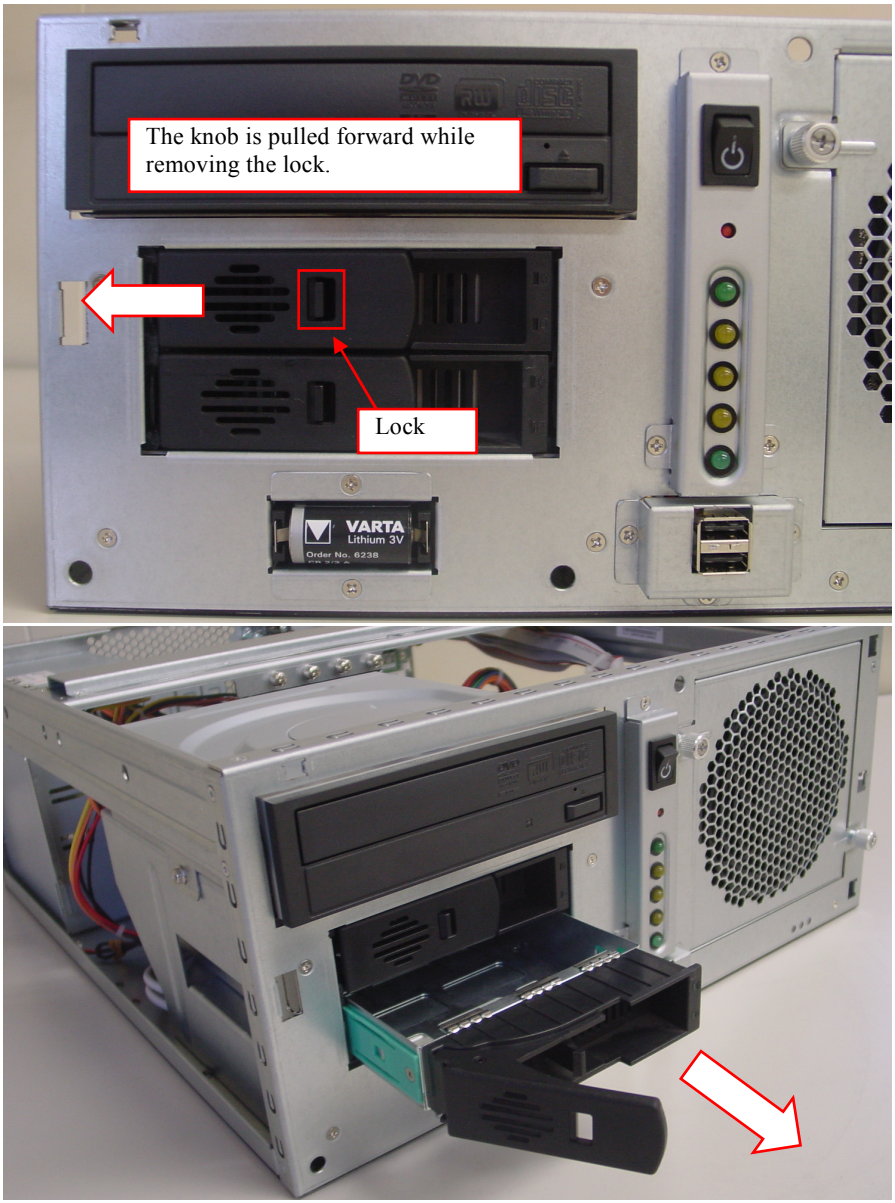


Figure 3.11 Expanding and replaying the hard disk (1)

(2) Remove and replace the HDD in the removed 5-inch bay.

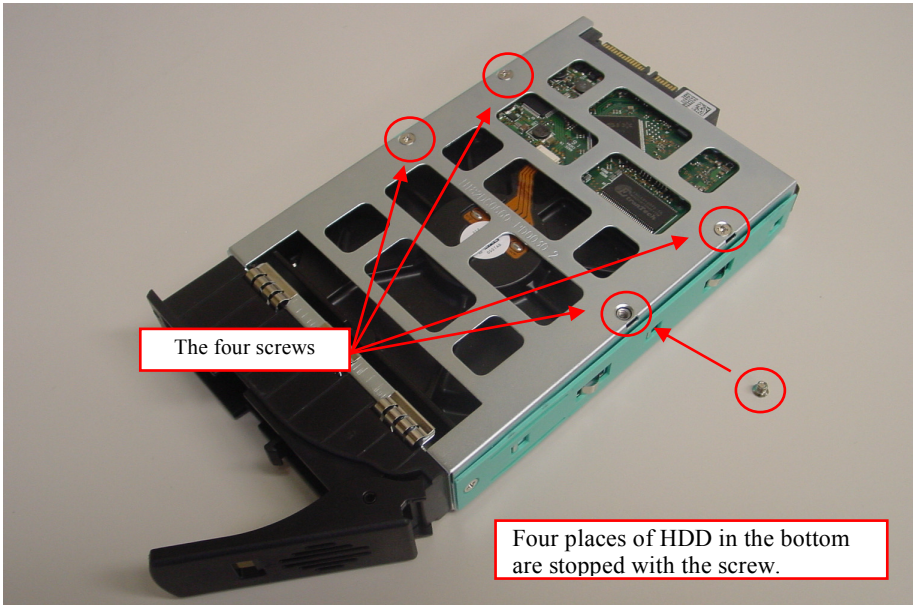


Figure 3.12 Attaching the hard disk in the drive bay (2)

(3) Reverse the removal procedure and re-insert it.

The replacement HDD must be an S-ATA drive. Note the specification.

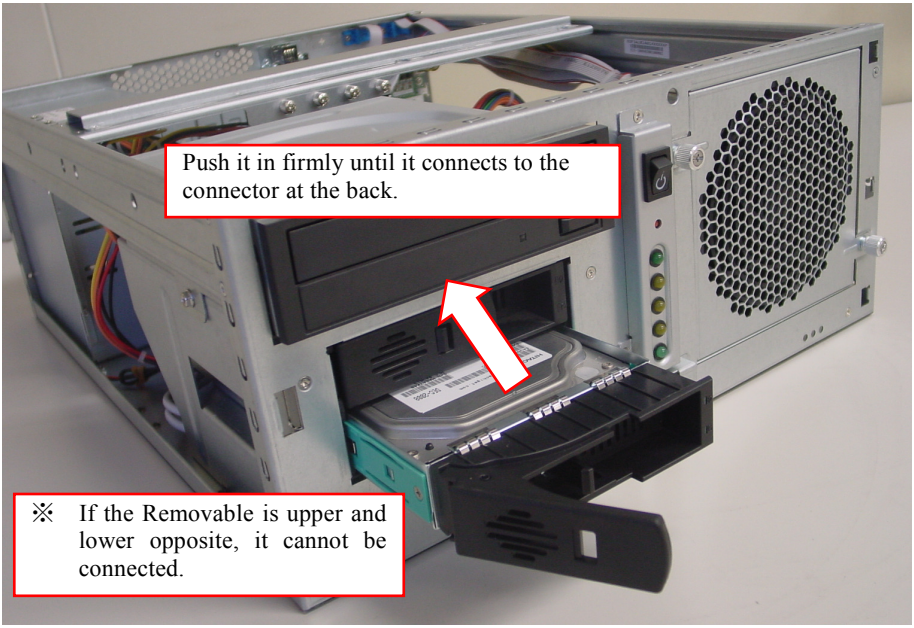


Figure 3.13 Expanding and replaying the hard disk (3)

◆Replacing the optical drive

(1) Remove all cables of the optical drive.

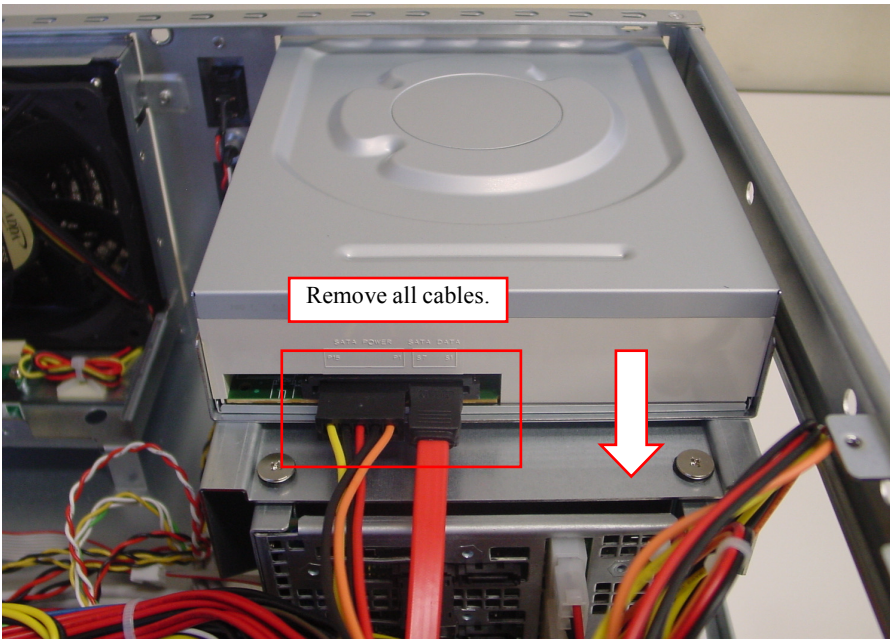


Figure 3.14 Removing all cables of the optical drive (1)

(2) Remove two screws from the bracket of the optical drive. It moves to horizontal direction, and it detaches it to the vertical direction.

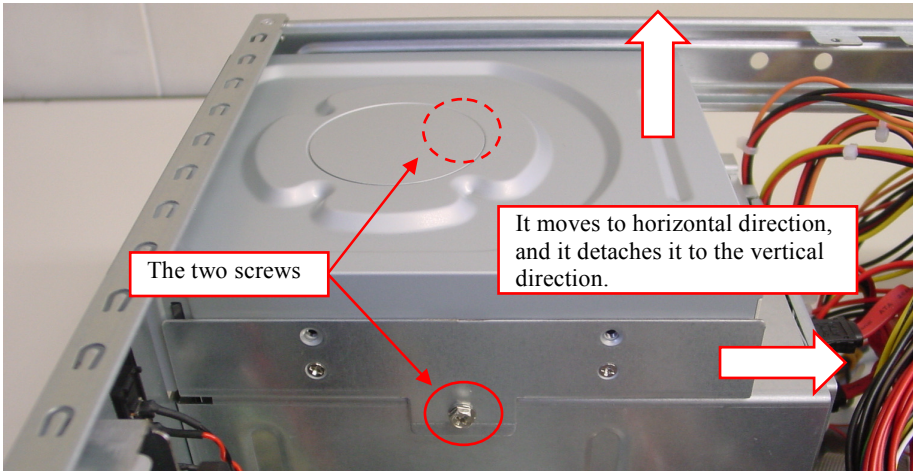


Figure 3.15 Removing the bracket for the optical drive

(3) Remove four screws and remove the optical drive.

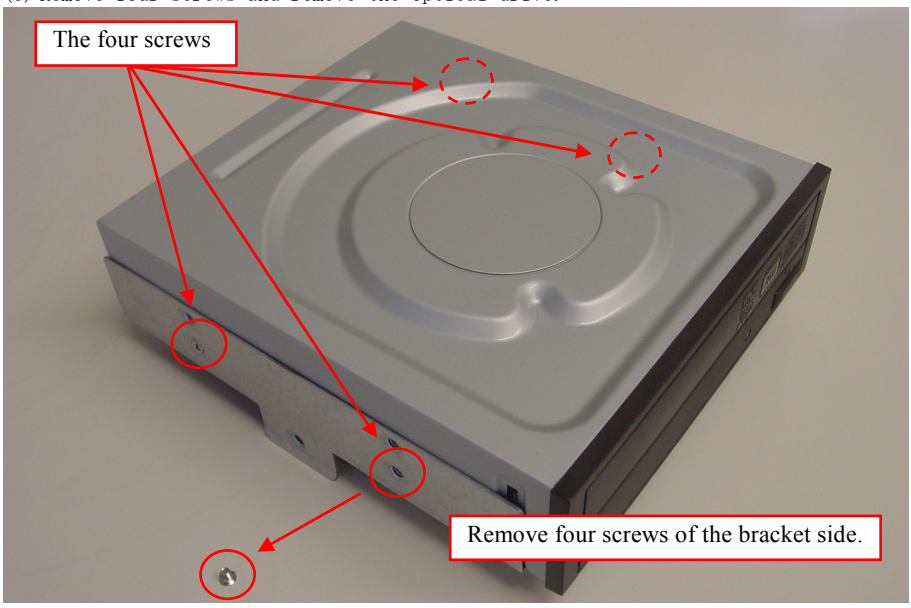


Figure 3.16 Removing the optical drive

(4) Reverse the removal procedure and re-insert it.

◆Attaching the expansion memory

(1) Insert expansion memory into the memory slot.
For DIMM A and DIMM B, use memory compliant with the specification.

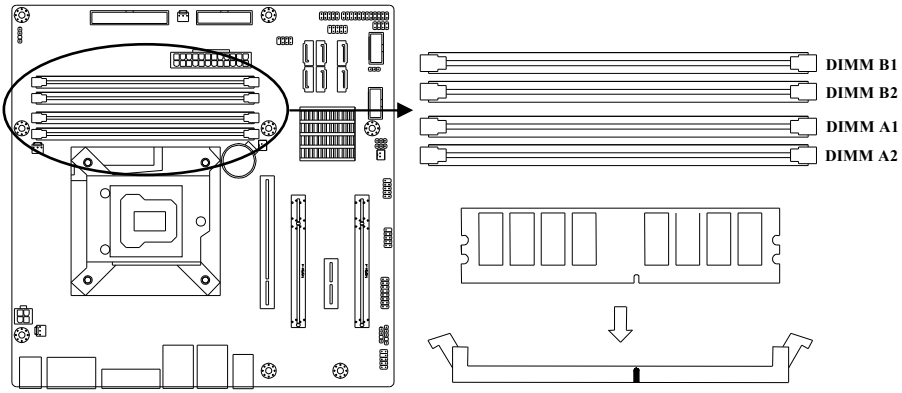


Figure 3.17 Attaching the expansion memory

(2) Lock the memory into the slot.

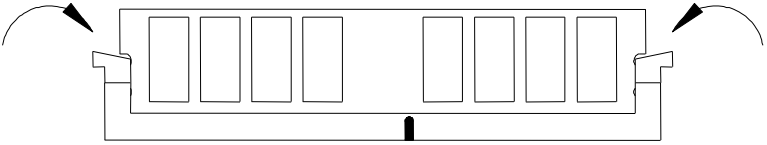


Figure 3.18 Lock the expansion memory

◆Attaching the extension board

(1) After unscrew the screw, remove the slot cover in the back of the chassis.

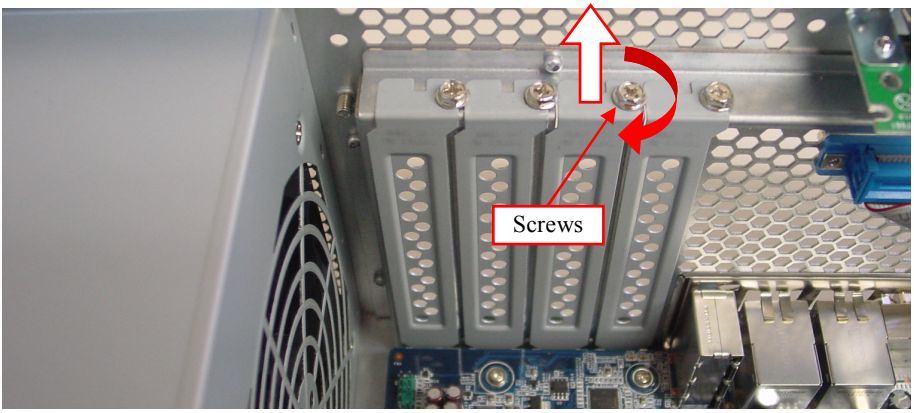


Figure 3.19 Removing the slot cover

(2) The extension board is installed, and it fixes with the screw.

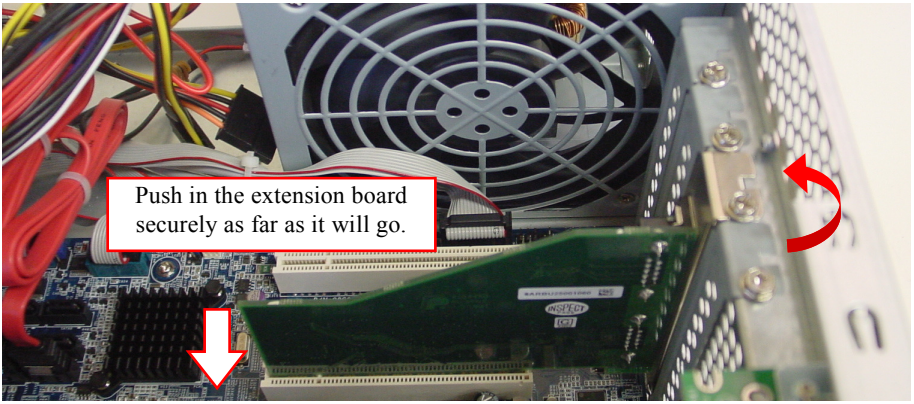


Figure 3.20 Attaching the expansion board

⚠CAUTION

Please install it very carefully might interface with the bend of various cables in the case when you install it according to the size of the extension board that installs it.

■Maximum dimensions of boards that can be installed:

176mm(L)×110mm(H) (All PCI Express x16,PCI Express x4,PCI bus)

(3) Reverse the attachment procedure and remove it.

◆Attaching the bracket for extension board

(1) After unscrew the screw, remove the bracket for extension board in the chassis.

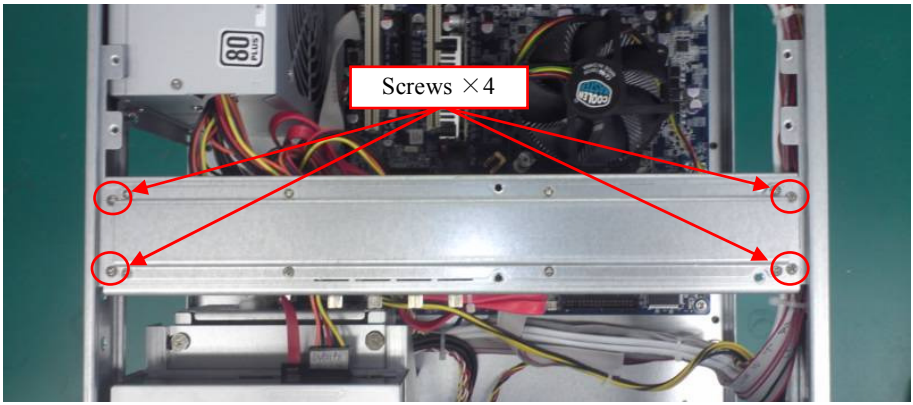


図3.21 Attaching the bracket for extension board(1)

(2) Unscrew the screw of bracket.

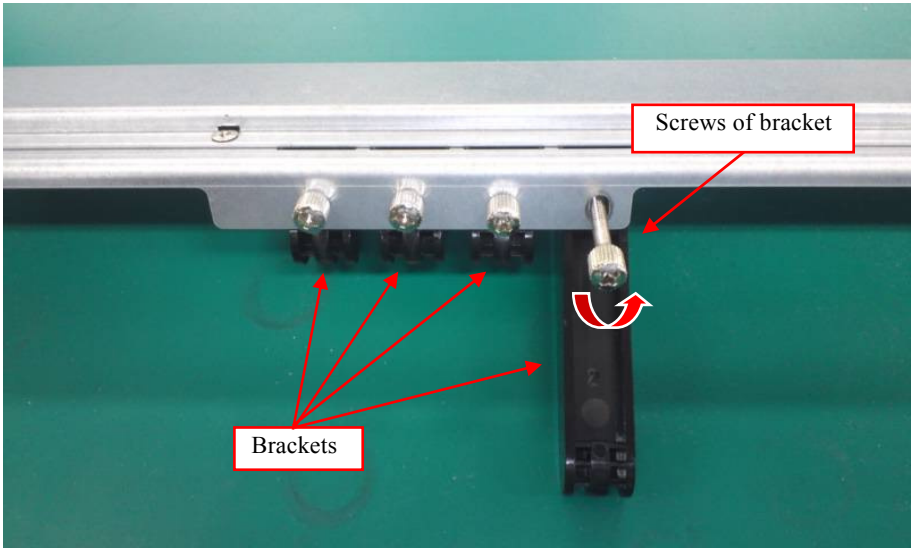


図3.22 Attaching the bracket for extension board(2)

(3) The bracket for extension board is installed, and it fixes with the screw.
Refer to a lower figure.

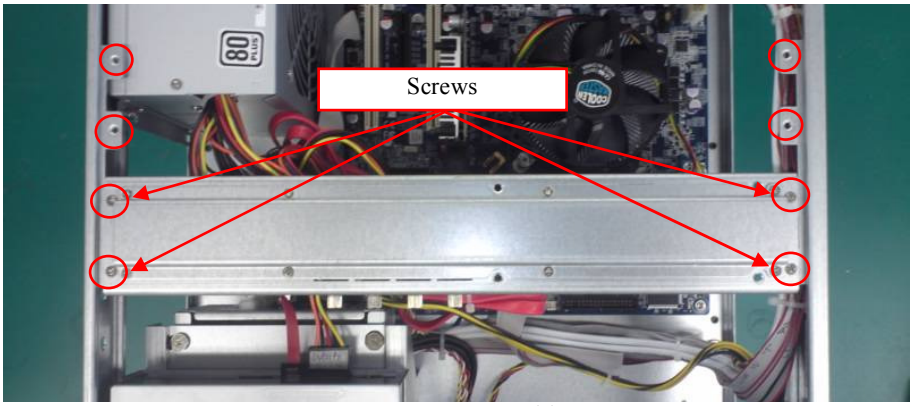


図3.23 Attaching the bracket for extension board(3)

(4)Fixes with the extension board and fixes with screw of bracket.
Refer to a lower figure.

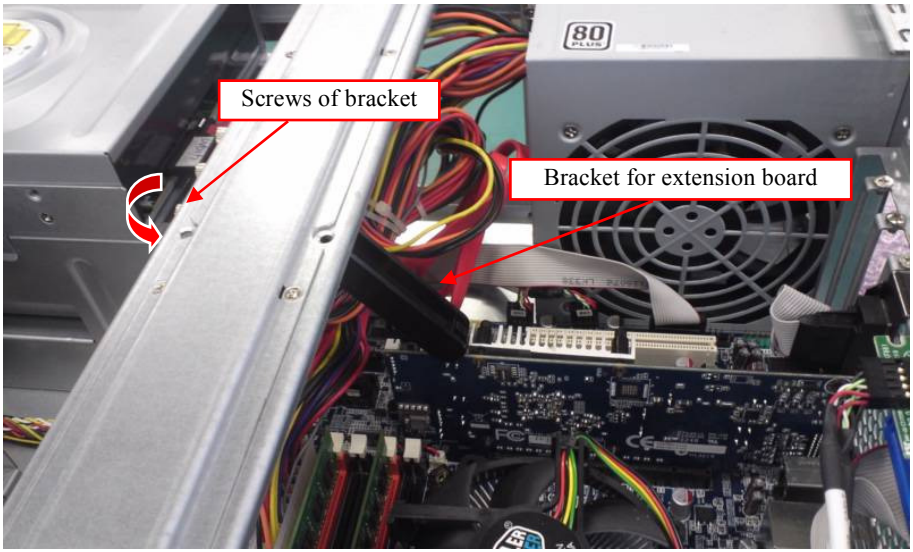


図3.24 Attaching the bracket for extension board(4)

◆Replacing the front fan unit

(1) Unscrew and remove the front fan unit.

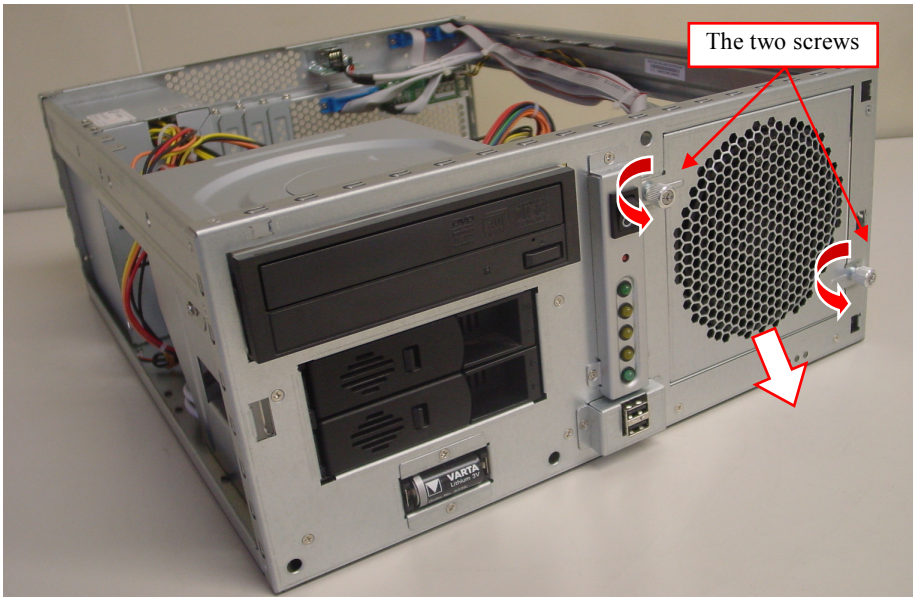


Figure 3.21 Removing the front fan

◆Replacing the dustproof filter

(1) After push the fan braket hole, remove the dustproof filter of each case.

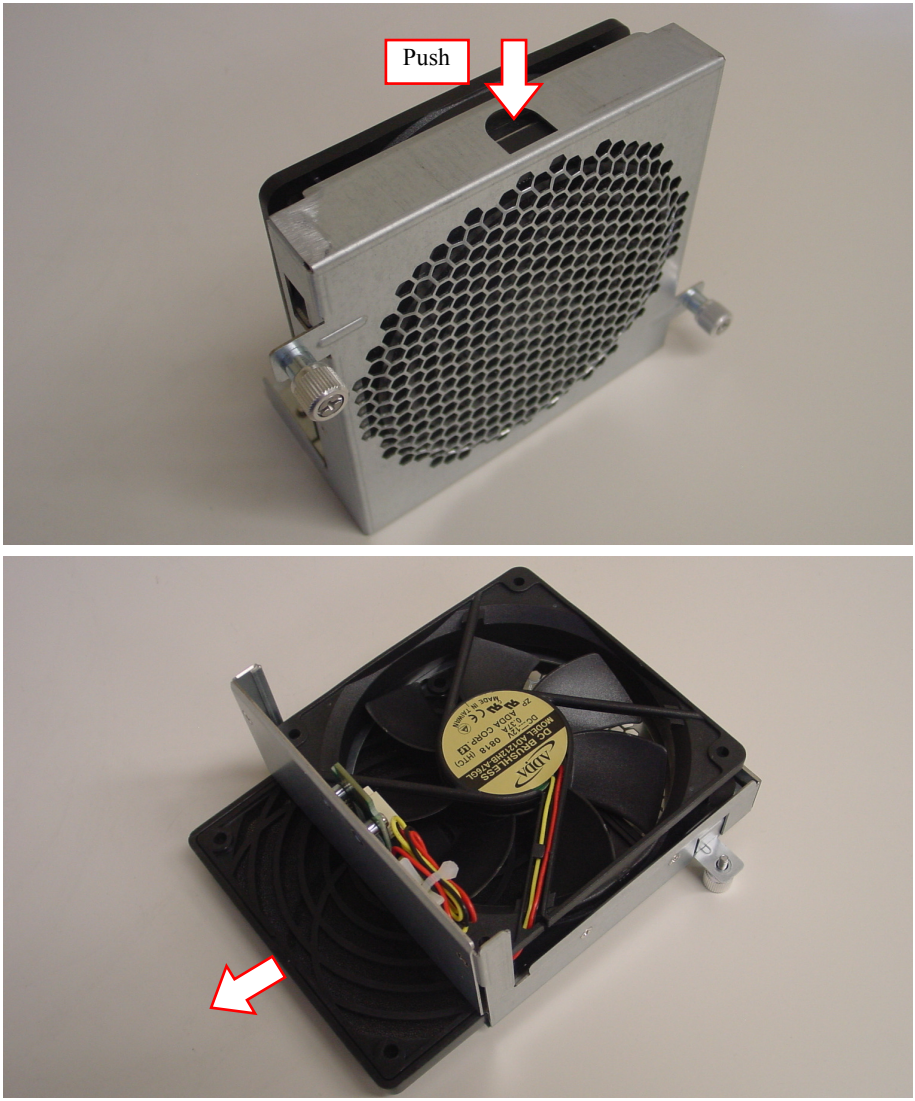


Figure 3.22 Replacing the dustproof filter (1)

(2) Remove four places , remove the case cover , and remove the dustproof filter.

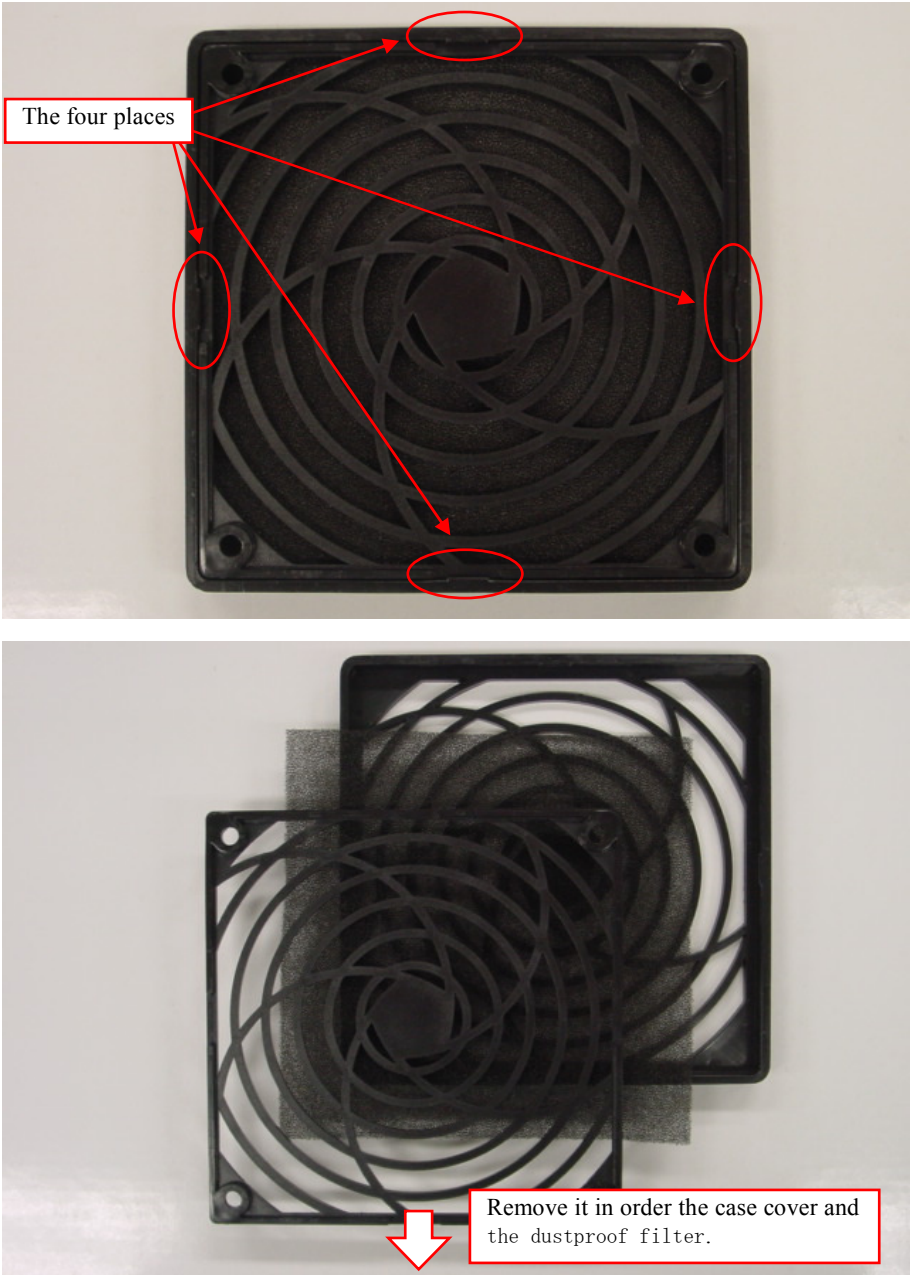


Figure 3.23 Replacing the dustproof filter (2)

(3) Reverse the removal procedure and re-insert it.

※During assembling the dustproof filter, the ditch of the case cover must come to the outside.

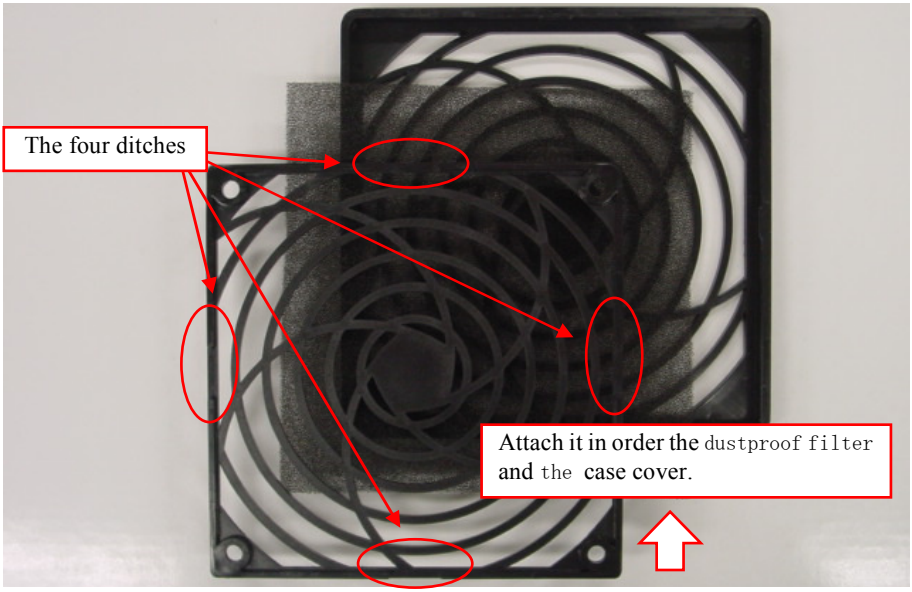


図3. 24 Attaching the dustproof filter (1)

※During attaching the dustproof filter, the tab part of the case cover must come to fan side.

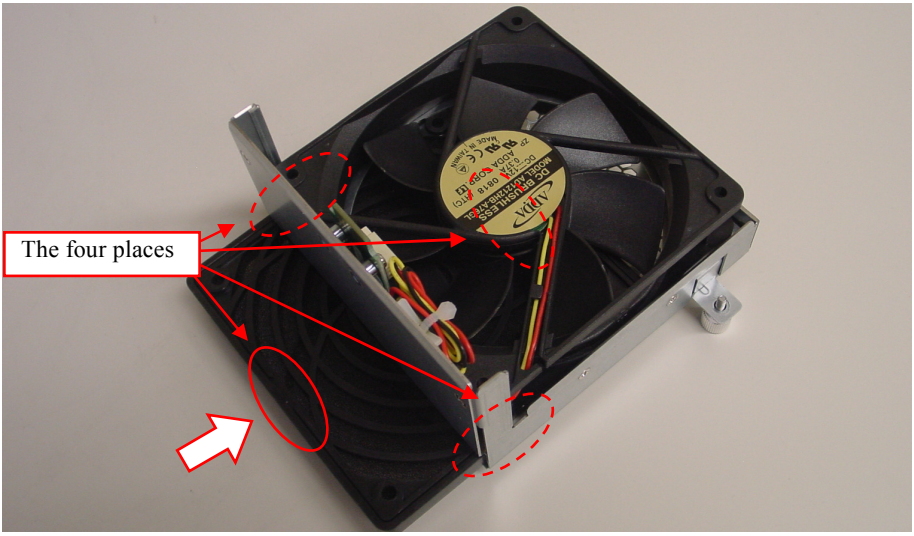


図3. 25 Attaching the dustproof filter (2)

◆Replacing the CMOS battery

(1) After remove the front bezel, Remove the CMOS battery.

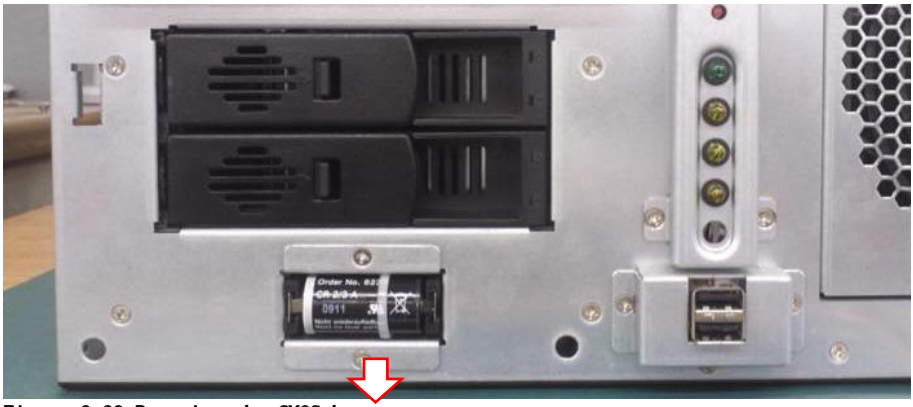


Figure 3.23 Removing the CMOS battery

(2) The exchanged CMOS battery is prepared and attached.

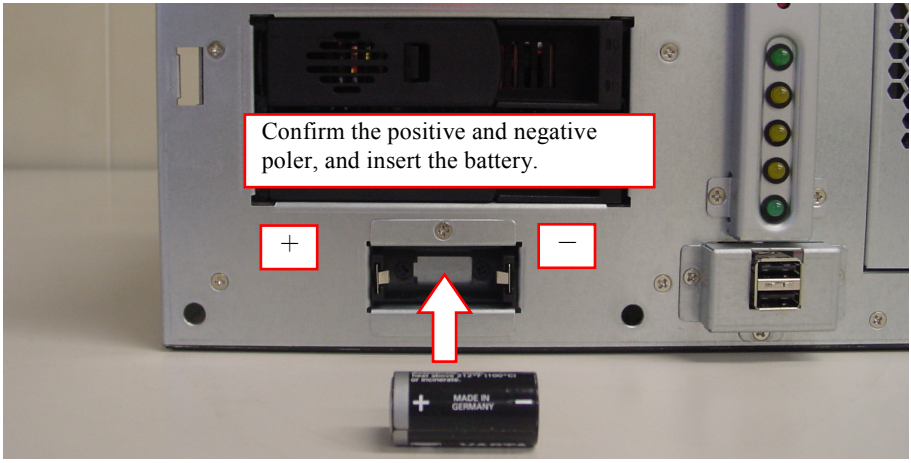


Figure 3.24 Replacing the CMOS battery

■CMOS Battery Specification

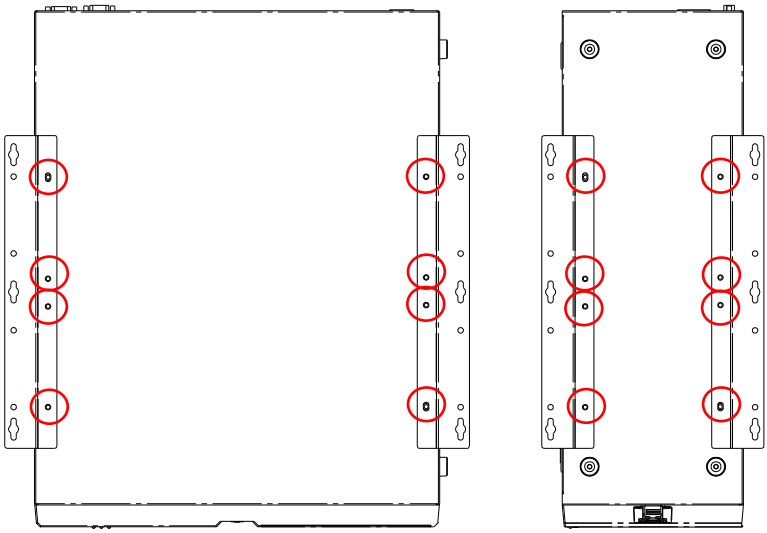
Type : CR2/3A

Voltage : 3V

Capacity : 1350 mAh

◆Option: Attaching the horizontal installation bracket

(1) Secure horizontal installation brackets with the four supplied screws.



【horizontal installation】 【Vertical installation】

Figure 3.25 Removing the horizontal installation bracket

⚠CAUTION

After attaching the stand, horizontal installation brackets are secured to the chassis.

During attaching horizontal installation brackets, ensure that the upper and lower it.

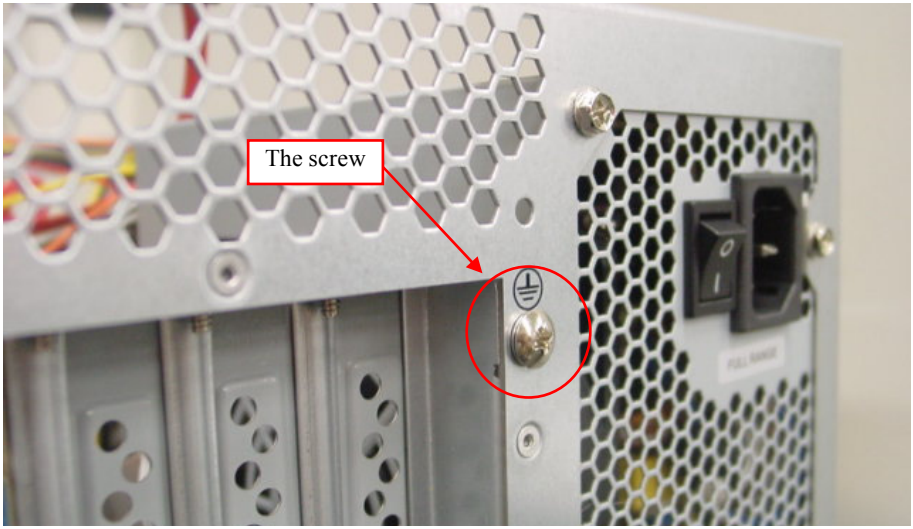
◆Option: Removing the horizontal installation bracket

(1) Remove the four screws anchoring the horizontal installation brackets.

(2) Remove the horizontal installation brackets from the chassis.

◆FG connection

(1) Remove the screw.



(2) Connect the FG cable with the removed screw.



◆Installation requirements

In order to enjoy reliable use of the VPC-2000 series, maintain the following conditions.

■Installable directions

Please do not use by the following installations, and do not set it up in other directions.

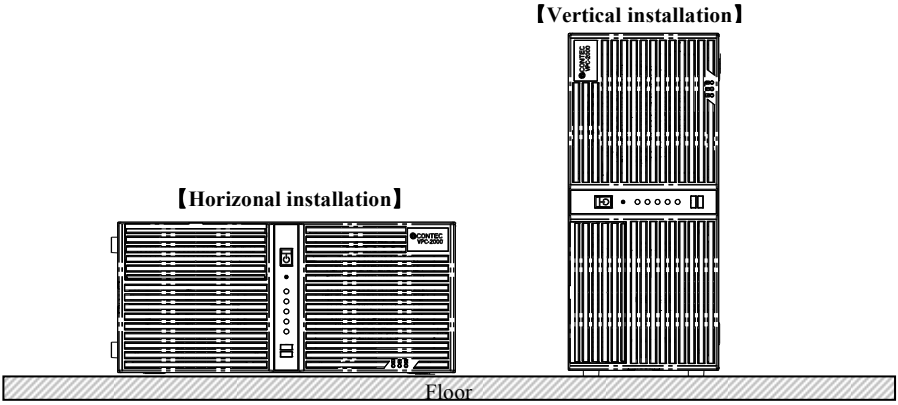


Figure 3.26 Installable direction

■Space between the main unit and its surroundings

The main unit of the VPC-2000 series is equipped with air vents and fans for regulating temperature. In order to ensure space for air vents and cables, keep distance described in the following between the front/rear and surrounding equipment, walls, etc.

Note that in the installation location, air must be able to circulate. Please adjust the flow of air so as not to exceed the specification temperature of the product.

Moreover, the unit cannot be used in an enclosed space.

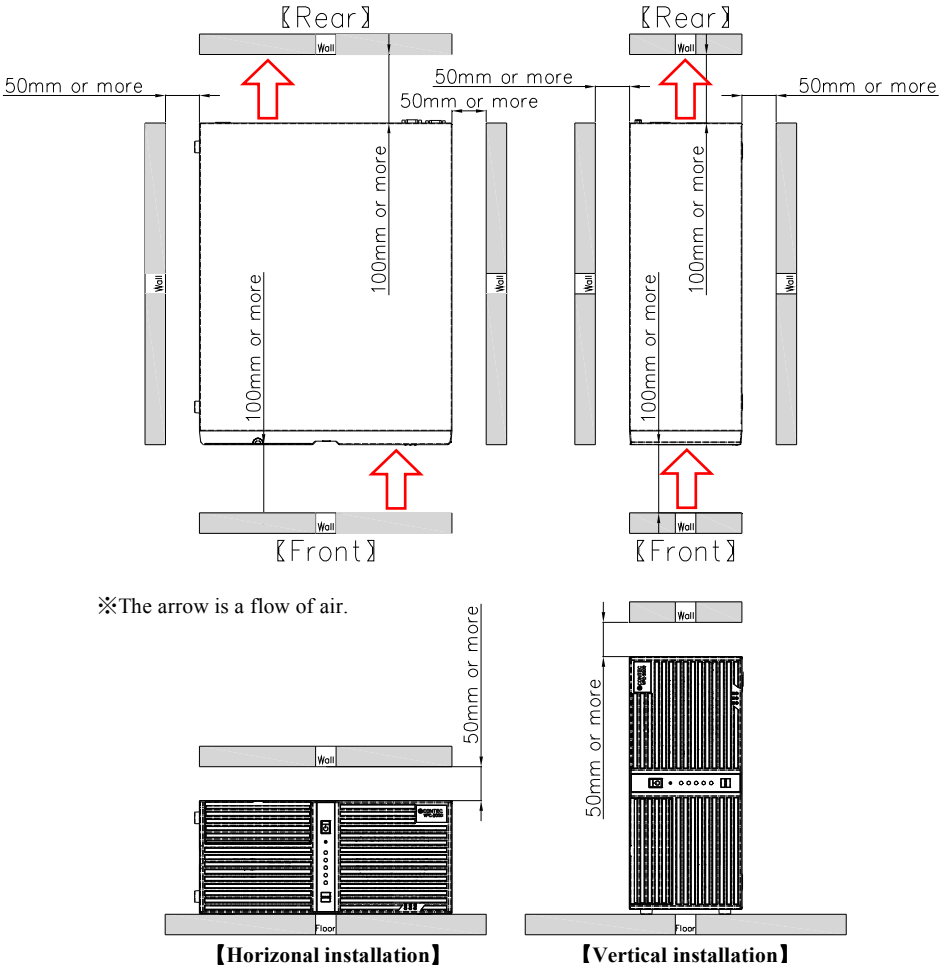


Figure 3.27 Installation condition

◆Removing the DIO pins

This cover is used for protecting the DIO pins.

(1) Removing the DIO cover screws

Remove the two screws anchoring the chassis to the DIO cover and remove the DIO cover.

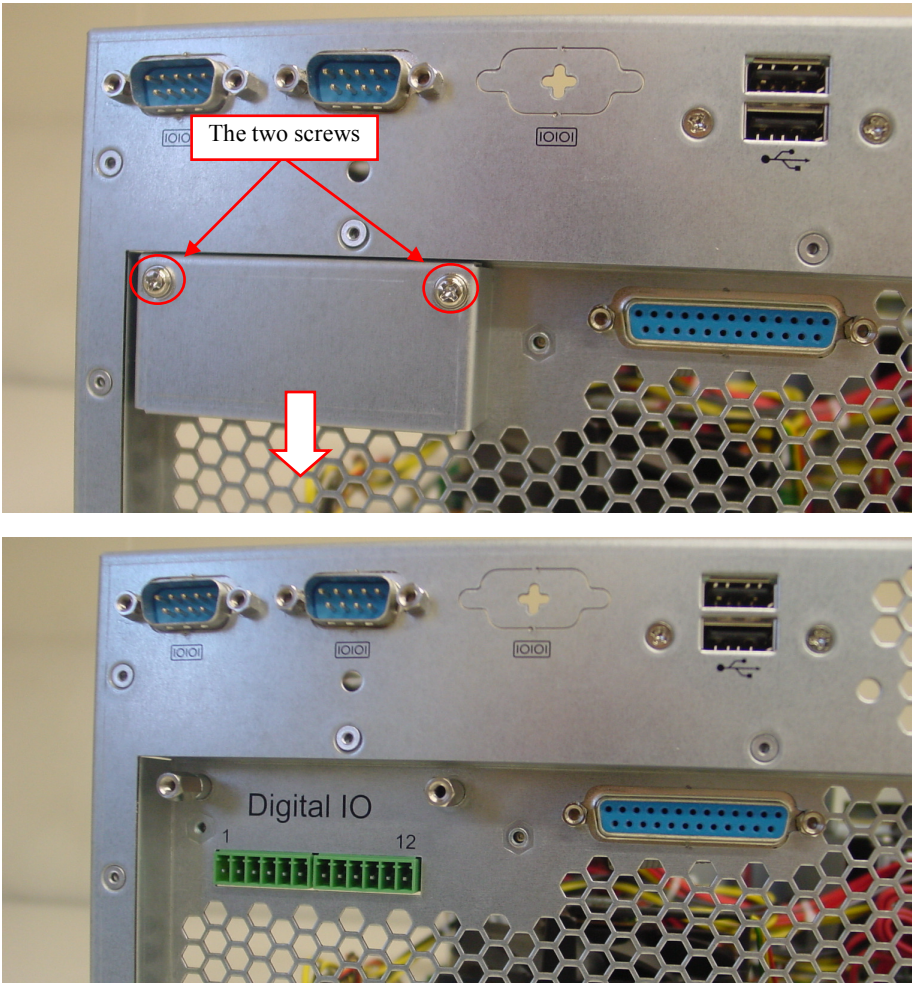


Figure 3.28 Removing the DIO cover

(2) Attaching the DIO pin cover

Reverse the procedure of removing the DIO pin cover and attach it.

◆Option: Attaching and removing the mirror card

(1) Remove all cables and such connected to the mirror card.

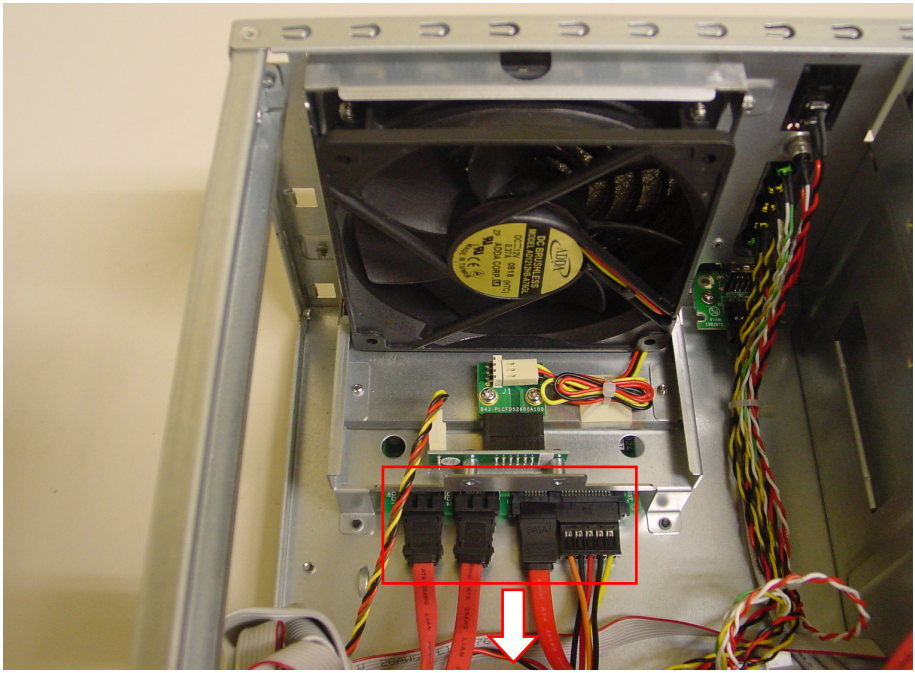


Figure 3.29 Removing all cables

※Starting from the left, the Serial-ATA cables from the upper HDD, lower HDD, motherboard, and power supply.

※During connection, ensure that the Serial-ATA cables of the upper and lower HDDs are not reversed.

(2) After remove the front fan, remove four screws anchoring the mirror card.

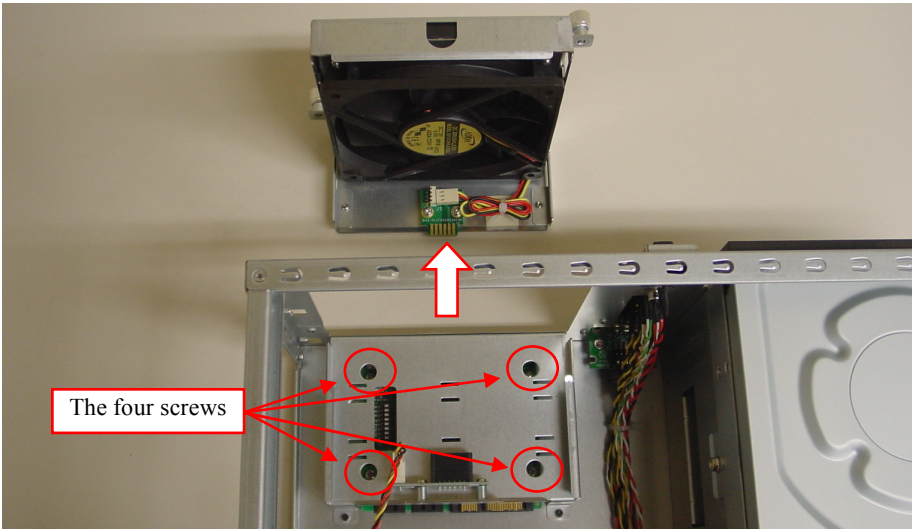


Figure 3.30 Removing four screws anchoring the mirror card

(3) Remove the mirror card.

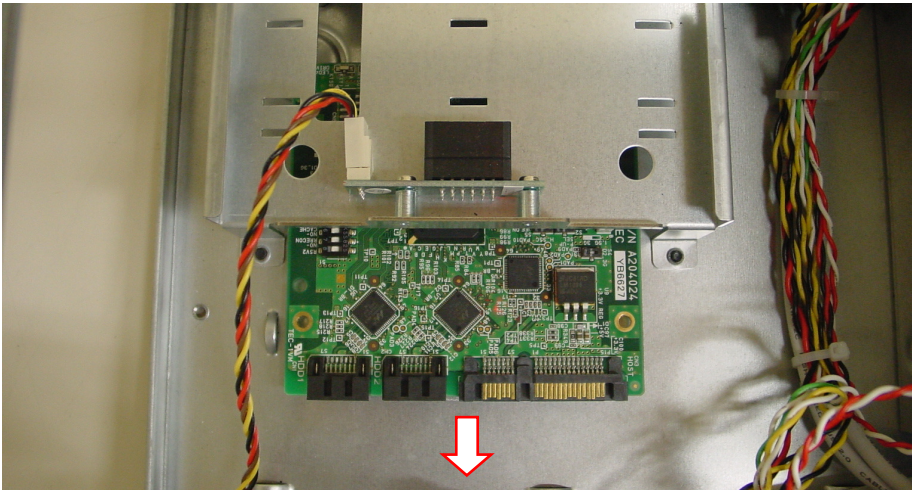


Figure 3.31 Removing the mirror card

(4) Assembly is the reverse of removal.

※During attaching, ensure that the direction and the upper and lower the mirror card.

Chapter 4 BIOS setup

BIOS setup sets various setting during startup. When using the system for the first time, besure to run BIOS setup. Once set up, the specified details will be backed up.

CAUTION

Do not change items not described in this document.
The system may become unstable and may not start up.

Starting the setup screen

When you turn on the power to the system, if the system is functioning normally, the "Press DEL to enter SETUP" screen appears. Then press the <DEL> key. After a few seconds, a setup utility can be started.

```
AMI BIOS (C) 2006 American Megatrends, Inc.
SMB-MQ570-LLVA BIOS Ver. 1.00
CPU : Intel(R) Core(TM) i5 CPU 660 @ 3.33GHz
 Speed : 3.33 GHz

Entering SETUP...
Press F11 for BBS POPUP
The IMC is operating with DDR3 1333MHz, 9 CAS Latency
DRAM Timings: Tras:24/Trp:9/Twr:10/Trfc:74/Twtr:5/Trrd:4/Trtp:5/Tfaw:20
Initializing USB Controllers .. Done.
1912MB OK
USB Device(s) : 2 Hubs
Auto-Detecting Pri Master..IDE Hard Disk
Auto-Detecting Pri Slave...
```

Figure 4.1 Initial screen

Key operation

This section provides a list of major key-bound functions during setup.

Table 4.1 Key operation list

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
ESC	Main Menu : Quit without saving changes Submenus : Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
ESC key	Main Menu : Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu : Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Main window

When you start the setup utility, the main window appears.

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
System Overview						
AMI BIOS						
Version	:**.**.**					
Build Data	:**/**/**					
ID	:********					
Processor						
Intel(R) Core(TM) i7 CPU 860 @ 2.80GHz						
Speed	:2800MHz					
Count	:1					
System Memory						
Size	:2008MB					
System Time		[**:**:**]				
System Date		[*** **/**/****]				

Figure 4.2 Example of main window screen

1. The cursor keys <↑>, <↓>, <→>, <←> allow you to navigate through menu items and the <Enter> key allows you to choose among them.
2. After pressing the <F10> key, you can save the current settings by pressing the <Enter> key or the <Y> key.

◆Setting of the date and time

In order to set the date and time of the calendar clock on the VPC-2000 series, follow the following steps.

1. Select “System Time” or “System Date” item from “Main” tab.
2. Select time (Time:) or date (Date:) items by pressing the <Page Up> and <Page Down> keys. You can navigate through items by pressing the cursor keys <←>, <→>.
3. Save setup changes with “Save Changes and Exit” (pressing the <F10> key) and exit.

Setting of the start password

After setting a startup password, you must enter the password when you run the setup utility and boot the system.

The password can protect system information and files, limiting their use by other users.

CAUTION

Once you register a password, you will not able to clear password features without the password. Pay careful enough attention in handling your password.

Supervisor Password	Not Installed
User Password	Not Installed
Change Supervisor Password	
User Access Level ※1	[Full Access]
Change User Password	
Clear User Password ※1	
Password Check ※1	[Setup]
Boot Sector Virus Protection	[Disabled]

※1 It is not displayed that Supervisor Password is not set.

Password setting	The operation of the setup utility
Supervisor	You can change all settings.
User	You can refer all setting, but you can not change setting ofitems. ※Usage restrictions can be decided by setting Supervisor Password.

1. Select “Change Supervisor Password” from “Security” tab.
2. After it is displayed as “ENTER PASSWORD:”, the password up to six character length is input and press <Enter> key.
3. Usage restrictions when it access the setup utility by User Password in “User Access Level” are set.

   Options are “No Access”, “View Only” “Limited”, and “Full Access” and select them arbitrarity.
4. Select “Change User Password”.
5. After it is displayed as “ENTER PASSWORD:”, the password up to six character length is input and press <Enter> key.

6. Set timing that password is demanded by “Password Check”
   Options are “Setup” and “Always” and select them arbitrarity.

Password Check setting	Operation
Setup	When setup utility starts
Always	When setup utility starts and system boot

7. After setting the desired order, press the <Esc> key and return to the Main window.
8. Save setup changes with “Save Changes and Exit” and exit.

Release of setted the password

Although the method for doing this is the same as setting a password, when you enter the password, press the <Enter> key without entering anything, and the password will be removed. Removing the Administrator Password works the same way.

⚠CAUTION

Before changing settings in the CMOS Setup, always remove the User Password.

Changing to the device boot order

It is possible to change device boot order.

1st Boot Device	[CD/DVD:PO-Optiarc]
2nd Boot Device	[SATA:PM-Hitachi HD]

1. Select “Boot Device Priority” menu from “Boot” tab.
2. Change the settings for “1st Boot Device”, “2nd Boot Device”, and etc… .
3. In order to assign top priority to booting from the CD-ROM, move the cursor to the “1st Boot Device” item and change the setting to “CD/DVD:…”. (Confirm your choice and setting by pressing the <Enter> key.)
4. After setting the desired order, press the <Esc> key and return to the Main window.
5. Save setup changes with “Save Changes and Exit” and exit.

Selecting to the IDE device

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
IDE Configuration						
Configure SATA as		[IDE]				
➢ SATA 1		[Not Detection]				
➢ SATA 2		[Not Detection]				
➢ SATA 3		[Not Detection]				
➢ SATA 4		[Not Detection]				
➢ SATA 5		[Not Detection]				
➢ SATA 6		[Not Detection]				
Hard Disk Write Protect		[Disabled]				
IDE Detect Time Out (Sec)		[35]				
ATA(PI) 80Pin Cable Detection		[Host & Device]				

1. Select “IDE Configuration” menu from “Advanced” tab.
2. Select “Configuration SATA as” item from “IDE Configuration” windows.
3. Change the settings for “Configuration SATA as”.
   (Options are “IDE”, “RAID”, and “AHCI”, but AHCI mode is not supported.)
4. After setting the desired order, press the <Esc> key and return to “Exit” tab.
5. Save setup changes with “Save Changes and Exit” and exit.

Setting for the power on (AT power operation) by the AC power-supply turning on

Lan1 Controller	[Enabled]
LAN1 Option-ROM	[Disabled]
Resume On LAN1	[Disasbled]
LAN2 Controller	[Enabled]
LAN2 Option-ROM	[Disabled]
HAD Controller	[Enabled]
SLP_A4# Min. Assertion Width	[4 to 5 seconds]
Restore on AC Power Loss	[Power On]
Resume On Ring	[Disabled]
Resume On PCI Express/LAN2	[Disabled]
Resume On PCI Device	[Disabled]

1. Select “South Bridge Chipset Configuration” menu from “Chipset” tab.
2. Select “Restore on AC Power Loss” menu from “South Bridge Chipset Configuration” windows.
3. Change “On” the settings for “Restore on AC Power Loss”.
4. After setting the above-mentioned 3, press the <Esc> key and return to “Exit”.
5. Save setup changes with “Save Changes and Exit” and exit.

Factory default setting

This section describes the CMOS Setup Utility's factory default settings.

By selecting "Load Optimal Defaults" in the Exit tab of the CMOS Setup Utility, you can restore our factory settings. For operational instructions, follow the following steps.

1. Select "Load Optimal Defaults" menu from Exit tab of the setup screen.
2. You are prompted to confirm that you are restoring to initial conditions. Press the <Y> and <Enter> keys.
3. Save setup changes with "Save Changes and Exit" and exit.

The following section describes parameters for the factory default settings of each setting in the CMOS Setup Utility.

⚠CAUTION

Do not change settings other than the CMOS Setup Utility settings specifically described in this document. The OS may not function normally otherwise.

We assume no responsibility for trouble caused by changing settings other than the CMOS Setup Utility settings specified.

◆MAIN

AMI BIOS
Version :**.**.**
Build Date :**/**/**
ID :********
Processor
Intel(R) Core(TM) i7 CPU 860 @ 2.80GHz
Speed :2800MHz
Count :1
System Memory
Size :2008MB
System Time [**:**:**]
System Date [*** **/**/****]

※ As the Main tab differ according to date and PC configuration, the above figure is a sample.

◆Advanced

➢ CPU Configuration ➢ IDE Configuration ➢ SuperIO Configuration ➢ Hardware Health Configuration ➢ ACPI Configuration ➢ AHCI Configuration ➢ ASF Configuration ➢ Remote Access Configuration ➢ USB Configuration ➢ Trusted Computing	

■CPU Configuration

Manufacturer :Intel		
Intel(R) Core(TM) i7 CPU 860 @ 2.80GHz		
Frequency :2.80GHz		
BCLK Speed :133MHz		
Cache L1 :256 KB		
Cache L2 :1024 KB		
Chace L3 :8192 KB		
Ratio Status :Unlocked (Min:09,Max:21)		
Ratio Actual Value :21		
Ratio CMOS Setting		[21]
Hardware Prefetcher		[Enabled]
Adjacent Cache Line Prefetch		[Enabled]
MPS and ACPI MADT ordering		[Modern ordering]
Max CPUID Value Limit		[Disabled]
Intel(R) Virtualization Tech		[Enabled]
Execute-Disable Bit Capability		[Enabled]
Intel(R) HT Technology	※1	[Enabled]
Active Processor Cores		[All]
A20M		[Disabled]
Intel(R) SpeedStep(tm) tech		[Enabled]
Intel(R) TurboMode tech	※1	[Enabled]
Intel(R) C-STATE tech		[Disabled]

※ It appears only using the Core i7.

■IDE Configuration

Configure SATA as	[IDE]
➢ SATA 1	[Not Detected]
➢ SATA 2	[Not Detected]
➢ SATA 3	[Not Detected]
➢ SATA 4	[Not Detected]
➢ SATA 5	[Not Detected]
➢ SATA 6	[Not Detected]
Hard Disk Write Protect	[Disabled]
IDE Detect Time Out (Sec)	[35]
ATA(PI) 80Pin Cable Detection	[Host & Device]

■SuperIO Configuration

WatchDog Function	[Disabled]
OnBoard Floppy Controller	[Enabled]
Serial Port1 Address	[3F8/IRQ4]
Serial Port2 Address	[2F8/IRQ3]
Parallel Port Address	[378]
Parallel Port Mode	[ECP & EPP]
EPP Version	[1.9]
ECP Mode DMA Channel	[DMA3]
Parallel Port IRQ	[IRQ7]
Serial Port3 Adress	[CA0]
Serial Port3 IRQ	[11]
Serial Port3 Mode	[Normal]
Serial Port4 Addrerss	[CA8]
Serial Port4 IRQ	[10]

■Hardware Health Configuration

Chassis Intrusion	[Disabled]
CPU Warning Temperature	[Disabled]
ACPI Shutdown Temperature	[Disabled]
System Temperature	26℃/78℉
CPU Temperture	39℃/102℉
CPUFAN Speed	2008 RPM
SYSFAN1 Speed	2250 RPM
SYSFAN2 Speed	0 RPM
Vcore	1.160 V
+3.3V	3.312 V
+5V	5.056 V
+12V	11.904 V
3VSB	3.456 V
5VSB	5.088 V
VBAT	3.007 V
CPUFAN0 Mode Setting	[Smart FAN III + Mod]
CPUFAN0 TargetTemp Value	[040]
CPUFAN0 Tolerance Value	[15]
CPUFAN0 StartUp Value	[255]
CPUFAN0 Stop Value	[064]
CPUFAN0 StopTime Value	[060]

※Because the numerical value is different according to the PC environment used, the above-mentioned reaches the reference value.

■ACPI Configuration

➢ General ACPI Configuration
➢ Chipset ACPI Configuration

●General ACPI Configuration

Suspend mode	[Auto]
Repost Video on S3 Resume	[No]

●Chipset ACPI Configuration

APIC ACPI SCI IRQ	[Disabled]
High Performance Event Timer	[Disabled]

■AHCI Configuration

AHCI BIOS Support	[Enabled]
➢ AHCI Port1 [Not Detected]	
➢ AHCI Port2 [Not Detected]	
➢ AHCI Port3 [Not Detected]	
➢ AHCI Port4 [Not Detected]	
➢ AHCI Port5 [Not Detected]	
➢ AHCI Port6 [Not Detected]	

■ASF Configuration

ASF Support	[Enabled]

■Remote Access Configuration

Remote Access	[Disabled]

■USB Configuration

Module Version - 2.24.5-13.4	
USB Devices Enabled :	
2 Hubs, 1 Drive	
Legacy USB Support	[Enabled]
USB 2.0 Controller Mode	[HiSpeed]
Legacy USB1.1 HC Support	[Enabled]

■Trusted Computing

TCG/TPM SUPPORT	[No]

■PCIPnP

Clear NVRAM	[No]

◆Boot

- Boot Setting Configuration

- Boot Device Priority
- Hard Disk Drives
- CD/DVD Drives

■Boot Setting Configuration

Quick Boot	[Enabled]
Quiet Boot	[Disabled]
AddOn ROM Display Mode	[Force BIOS]
Bootup Num-Lock	[On]
PS/2 Mouse Support	[Auto]
Wait For ‘F1’ If Error	[Enabled]
Hit ‘DEL’ Message Display	[Enabled]
Interrupt 19 Capture	[Disabled]

■Boot Device Priority

1st Boot Device	[CD/DVD:PO-Optiarc]
2nd Boot Device	[SATA:PM-WDC WD2503]

◆Security

Supervisor Password	Not Installed
User Password	Not Installed
Change Supervisor Password	
Change User Password	
Boot Sector Virus Protection	[Disabled]

◆Chipset

- North Bridge Configuration
- South Bridge Configuration
- Intel AMT Configuration
- Intel VT-d Configuration
- ME Subsystem Configuration
- VE Subsystem Configuration

■North Bridge Configuration

IMC Type : *Field Family IMC		
Memory Remap Feature		[Enabled]
Fast MRC		[Disabled]
PCI MMIO Allocation : 4GB To 3072MB		
DRAM Frequency		[Auto]
Configure DRAM Timing by SPD		[Auto]
Memory Hole		[Disabled]
DRAM Margin Ranks		[Disabled]
Initiate Graphic Adapter		[PCIE/PCI]
IGD Graphic Mode Select	※1	[Enabled, 32MB]
IGD GTT Graphic smemory size		[No VT mode. 2MB]
NB PCIE Configuration		
PEG Port	※1	[Auto]
PEG Force GEN1		[Disabled]

■Souoth Bridge Configuration

LAN1 Controller		[Enabled]
LAN1 Option-ROM		[Disabled]
Resume On LAN1		[Disabled]
LAN2 Controller		[Enabled]
LAN2 Option-ROM		[Disabled]
HDA Controller		[Enabled]
Internal HDMI	※1	[Disabled]
		[4 to 5 seconds]
SLP_S4# Min. Assertion Width		[Power Off]
Restore on AC Power Loss		
		[Disabled]
Resume On Ring		[Disabled]
Resume On PCI Express/LAN2		[Disabled]
Resume On PCI Device		

■Intel AMT Configuration

Intel AMT Support	[Enabled]
Force IDER	[Disabled]
Force SOL	[Disabled]
Unconfigure AMT/ME	[Disabled]
Activate Remote Assistance	[Disabled]
MEB# Ctrl+P Delay (Seconds)	[0]

■Intel VT-d Configuration

Intel VT-d	[Disabled]

■ME Subsystem Configuration

Boot Block HECI Message	[Disabled]
HECI Message	[Enabled]
End Of Post S5 HECI Message	[Enabled]
ME HECI Configuration	
ME-HECI	[Enabled]
ME-IDER	[Enabled]
ME-KT	[Enabled]
Management Engine Version : 6.0.0.1104	

■VE Subsystem Configuration

VECI Message	[Disabled]

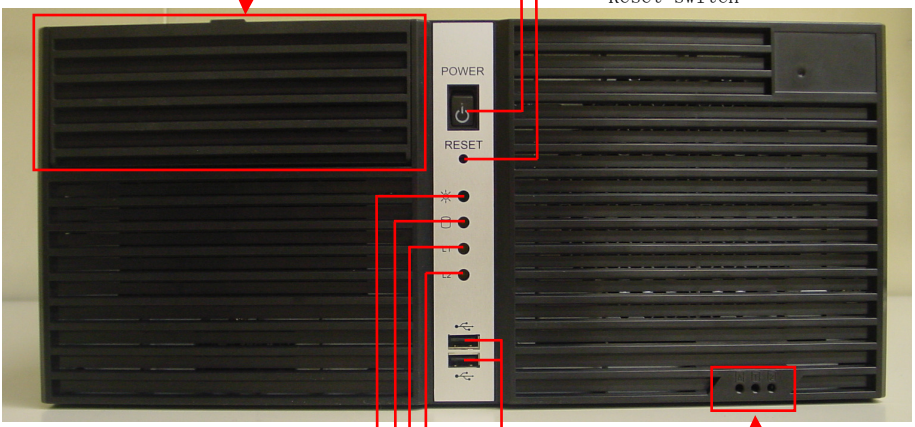
◆Exit

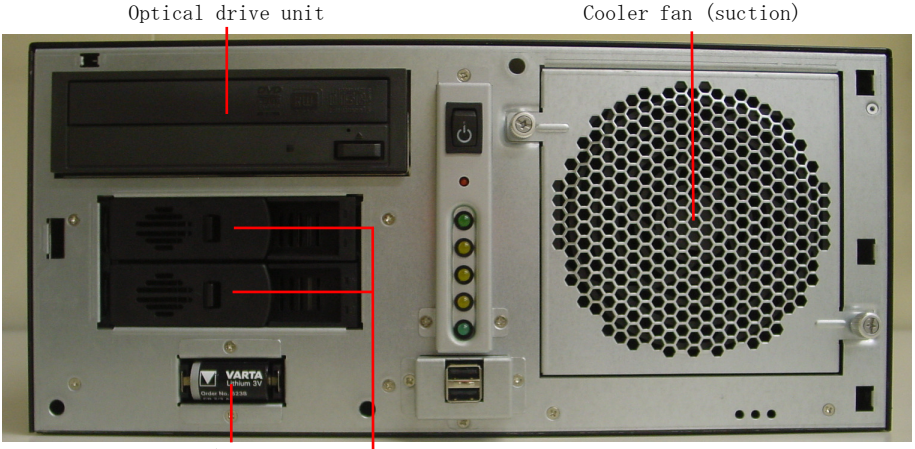
Save Changes and Exit	
Discard Changes and Exit	
Discard Changes	
Load Optimal Defaults	
Load Faisafe Defaults	

Chapter 5 Each component function

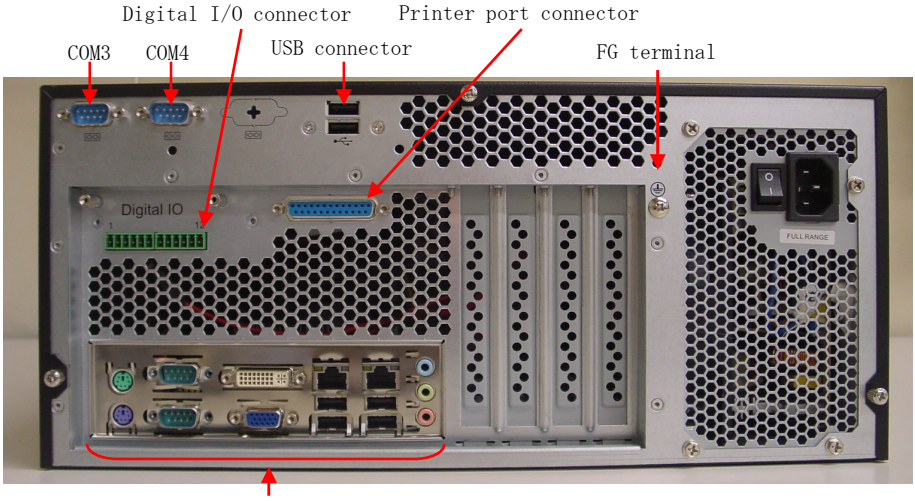
Component name

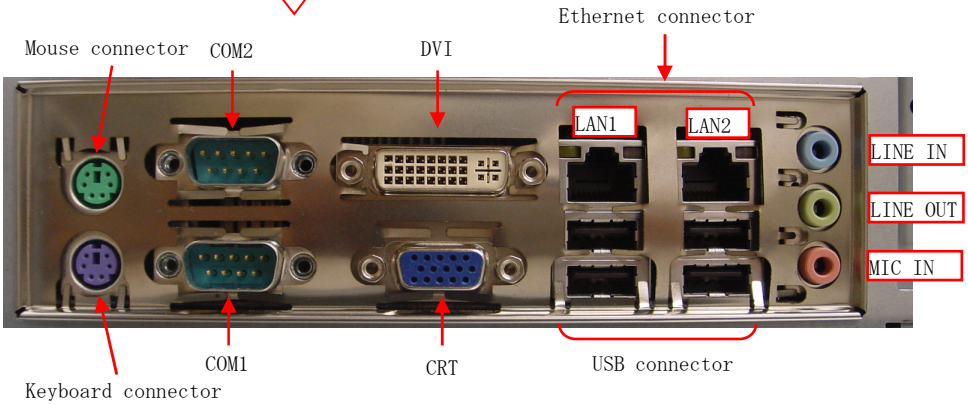
◆VPC-2000 front view





◆VPC-2000 rear view



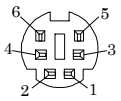


Component Function

◆Keyboard interface

A connector for connecting a keyboard is provided. Connector name is KB(6Pin mini-DIN).

Table 5.1 Keyboard connector

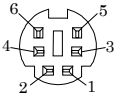


Pin No.	Function
1	K.B DATA
2	N.C.
3	GND
4	+5V
5	K.B CLOCK
6	N.C.

◆Mouse interface

A connector for connecting a mouse is provided. Connector name is MOUSE(6Pin mini-DIN).

Table 5.2 Mouse connector



Pin No.	Function
1	MOUSE DATA
2	N.C.
3	GND
4	+5V
5	MOUSE CLOCK
6	N.C.

◆Serial port interface

< RS-232C port (COM1,COM2,COM3,COM4)>

Three RS-232C-compliant serial port connectors are provided. Resources can be either assigned or reserved for each port independently through BIOS setup (see Chapter 4).

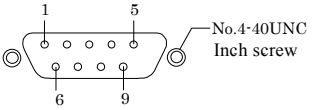
Table 5.3 SERIAL1, 2 I/O address、interrupt

COM	I/O Address	Interrupt
COM1	3F8h 3E8h 2E8h	IRQ4 IRQ4 IRQ3
COM2	2F8h 3E8h 2E8h	IRQ3 IRQ4 IRQ3
COM3	CA0h CA8h CB0h CB8h	 IRQ11 IRQ10
COM4	CA0h CA8h CB0h CB8h	 IRQ10 IRQ11

The factory default settings of the BIOS are as follows.
COM1:3F8h,IRQ4
COM2:2F8h,IRQ3
COM3:CA0h,IRQ11
COM4:CA0h,IRQ10

Table 5.4 Serial port connector

Connector	D-SUB 9 Pin (MALE)

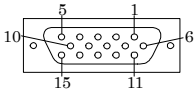


Pin No.	Signal	Direction
1	DCD	Input
2	SIN	Input
3	SOUT	Output
4	DTR	Output
5	GND	-
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	RI	Input

◆CRT interface

A connector for connecting a CRT is provided. Connector name is VGA(15PinD-SUB).

Table 5.5 CRT connector

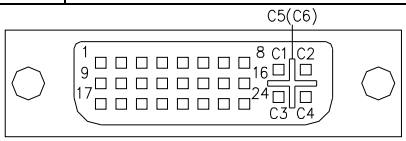
Connector		D-SUB 15 Pin (FEMALE)	
			
Pin No.	Function	Pin No.	Function
1	RED	9	VCC_TMDS
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC_DAT
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC_CLK
8	GND		

◆DVI interface

A connector for connecting a DVI is provided. Connector name is DVI(29Pin).

Table 5.6 DVI connector

Connector	DVI connector 29 Pin (FEMALE)



Pin No.	Function	Pin No.	Function	Pin No.	Function
1	TMDS 2-	11	TMDS 1/3 Shield	21	N.C.
2	TMDS 2+	12	N.C.	22	TMDSCLK Sheild
3	TMDS 2/4 Shield	13	N.C.	23	TMDSCLK+
4	N.C.	14	+5V	24	TMDSCLK-
5	N.C.	15	GND	C1	N.C.
6	DDC_CLK	16	HOTPLUG_DETECT	C2	N.C.
7	DDC_DATA	17	TMDS 0-	C3	N.C.
8	N.C.	18	TMDS 0+	C4	N.C.
9	TMDS 1-	19	TMDS 0/5 Shield	C5	AGND
10	TMDS 1+	20	N.C.	C6	AGND

◆Printer port interface

One printer port interface is provided. Resources can be either assigned or reserved through BIOS setup (see Chapter 4).

Table 5.7 Printer port and I/O address

LPT	I/O Address	Interrupt	DMA
1	378 278 3BC	IRQ 5 IRQ 7	DMA 0 DMA 1 DMA 3

The factory default settings of the BIOS are as follows.

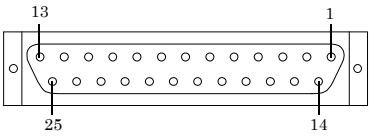
Mode:[ECP & EPP]、Base I/O address:[378]、Interrupt:[IRQ 7]、

EPP version:[1.9]、DMA Channel:[DMA3]

⚠CAUTION

I/O address [3BC] can be selected only in Modes [Bi-Directional]. DMA Channel is used only in Mode [ECP].

Table 5.8 Printer port connector

Connector	D-SUB 25 pin (FEMALE)				
					
Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	STB	Output	14	AFD	Output
2	D0	Output	15	ERR	Input
3	D1	Output	16	INIT	Output
4	D2	Output	17	SLIN	Output
5	D3	Output	18	GND	-
6	D4	Output	19	GND	-
7	D5	Output	20	GND	-
8	D6	Output	21	GND	-
9	D7	Output	22	GND	-
10	-ACK	Input	23	GND	-
11	BUSY	Input	24	GND	-
12	PE	Input	25	GND	-
13	SLCT	Input	-		
Fixed screw : No.4-40UNC inch screw					

◆Reset switch

Push this button when resetting hardware.

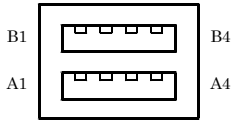
◆Power switch

Push this button at power-on. In order to turn off the power forcibly, hold it down for four seconds or longer.

◆USB port

Six USB interfaces are provided.

Table 5.9 USB connector



Pin No.	Function	Pin No.	Function
A1	USB0 Vcc	B1	USB1 Vcc
A2	USB0 -Data	B2	USB1 -Data
A3	USB0 +Data	B3	USB1 +Data
A4	USB0 GND	B4	USB1 GND

◆Ethernet

The VPC-2000 is equipped with two channels for Ethernet.

- Network type : 10BASE-T/100BASE-TX/1000BASE-T
- Transmission speed : 10M/100M/1000Mbps
- Max. network path length : 100m/segment
- Controller : Intel 82578DM Gigabit Ethernet (LAN1)
  Intel 82583V Gigabit Ethernet (LAN2)

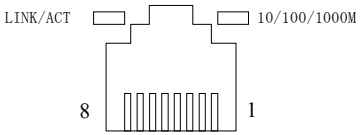
⚠ 注意

1000Mbps operation requires a cable of category 5E or greater.

LAN1 port may become unstable at a low temperature.

We recommend use the LAN2 port.

Table 5.10 Ethernet connector

Connector type	RJ-45	
		
Pin No.	Signal name	Function
1	TD+	Transmission data(+)
2	TD-	Transmission data(-)
3	RD+	Receive data(+)
4	GND	Ground
5	GND	Ground
6	RD-	Receive data(-)
7	GND	Ground
8	GND	Ground

LEDs for display of network statuses

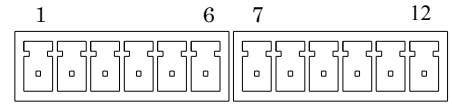
LINK/ACT LED : (Yellow) Lighting at the normal connection.
(Yellow) Blinking at the data transmission and receive.

10/100/1000M LED : Turning off at the 10M operation.
(Orange) Lighting at the 100M operation.
(Green) Lighting at the 1000M operation.

◆Digital I/O interface

This interface controls digital I/O with two rows of six pins (JDIO1, JDIO2).
Among the eight DIO pins, two output pins (02, 03) are used for the user LED on the front.
The digital I/O interface is internally insulated.

Table 5.11 Digital I/O Connector



JDIO1 JDIO2

JDIO1		JDIO2	
Pin No.	Signal	Pin No.	Signal
1	I0	7	O0
2	I1	8	O1
3	I2	9	O2 (Connected prohibition)
4	I3	10	O3 (Connected prohibition)
5	PWRON	11	COMPO
6	RST	12	COMPI

1) I0～I3 (JDIO1 Pin No. 1～4)

Input signal : You can input Input0, Input1, Input2, and Input3.

2) O0～O3 (JDIO2 Pin No. 7～10)

Output signal : You can output Onput0, Onput1, Onput2, and Onput3.

※You can not use Output2,3 because they are used for the user LED on the front.

3) PWRON,RST (JDIO1 Pin No.5,6)

Short-circuiting PWRON and GND or RST and GND triggers the same operation as pushing the Power button or Reset button on the front.

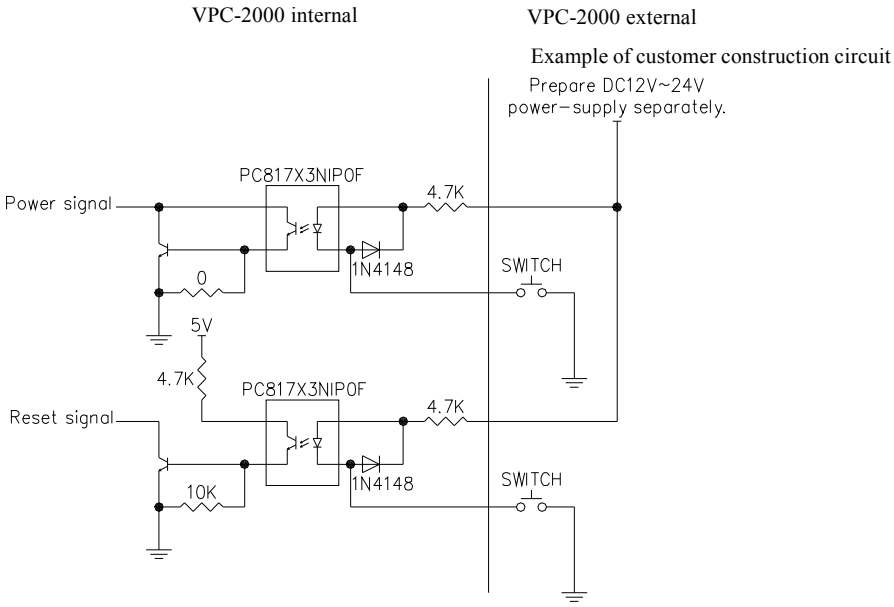
※However, the power-supply from the outside is necessary.

4) COMPO,COMPI (JDIO2 Pin No.11,12)

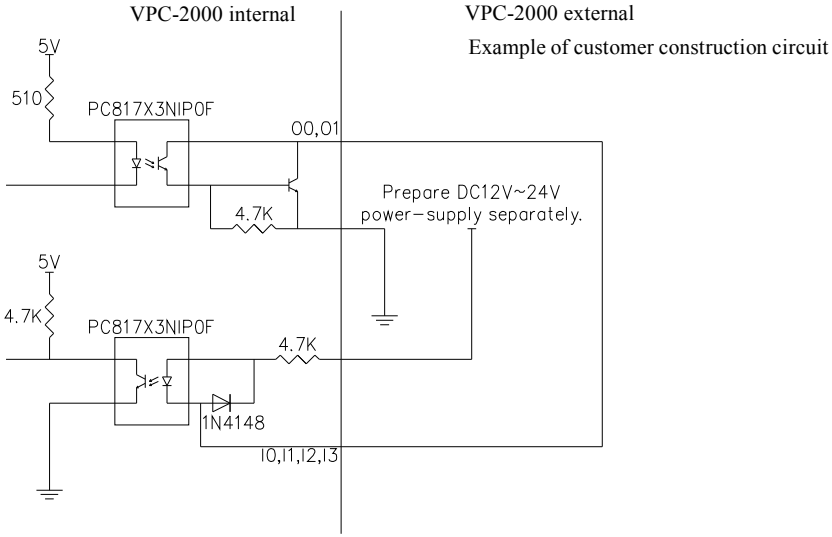
These are used for the power-supply from the outside.

COMPO is GND and COMPI is VCC.

Internal equivalent circuit chart of the remote power and the remote reset



External I/O connection VPC-2000 internal equivalent circuit diagram



◆Audio interface

The Audio interface. is provided.

Table 5.12 Audio connector

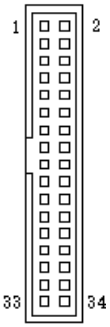


Pin No.	Signal name
Blue	Line-In
Green	Line-Out
Pink	Mic-In

◆Floppy disk interface

The floppy disk interface is provided.

Table 5.13 Floppy disk connector

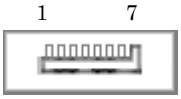


Pin No.	Signal name	Pin No.	Signal name
1	GND	2	RWC
3	GND	4	NC
5	Key (No Pin)	6	NC
7	GND	8	Index-
9	GND	10	MOTA-
11	GND	12	NC
13	GND	14	DSA-
15	GND	16	NC
17	GND	18	FDIR-
19	GND	20	STEP-
21	GND	22	WDATA-
23	GND	24	WGATE-
25	GND	26	Track 0-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Head Select-
33	GND	34	Diskette Change-

◆Serial ATA interface

Six serial ATA port interfaces are provided.

Table 5.14 Serial ATA connector



Pin No.	Signal name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Chapter 6 Software utirity

This chapter describes the driver DVD included with the VPC-2000 series. This driver DVD includes drivers and software necessary for the VPC-2000 series.

This driver DVD does not provide Autorun functionality. Install drivers and software manually through Windows Explorer after inserting this driver DVD into the CD/DVD-ROM drive.

CAUTION

The contents of the driver DVD are subject to change without prior notice.

Pre-installed models are not accompanied by a driver DVD. A driver DVD is included with models that come without an OS.

Driver DVD

The directory structure of the driver DVD is shown below.

CAUTION

In the recovery media, the following directory doesn't exist.

Please download each driver and utility from our homepage for the pre-install model.

```
OEM
  ├──Documents
  ├──Drivers          ← Pre-installed models have these installed in the OS.
  |     ├──Audio
  |     ├──Chipset
  |     ├──Lan
  |     ├──Raid
  |     ├──Tpm
  |     └──Vga
  ├──IO-Lib(NT)       ← Pre-installed models haven't these installed in the OS.
  ├──TinyRAS          ← Pre-installed models haven't these installed in the OS.
  └──HWRAID           ← Pre-installed models haven't these installed in the OS.
```

- Documents : A copy of this information is stored here.
- Drivers : Versions of the installation files for the chipset, graphics, LAN, audio, and security chip drivers are included separately for Windows XP and Windows 7.
- IO-Lib(NT) : Install file of general purpose I/O driver is stored here.
- TinyRAS : Install file of RAS tool is stored here.
- HWRAID : Install file of hardware raid tool tool is stored here.

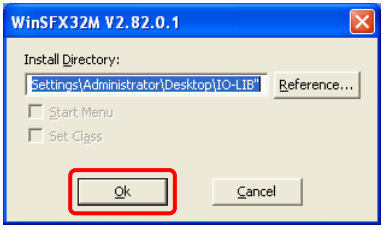
Various drivers

Install chipset, graphics, LAN, audio, and security chip drivers in the “Drivers” folder. Since the driver to install depends on which OS is used, install the drivers appropriate for your OS.

IO-Lib(NT)

The general purpose I/O driver can be installed using the “LZF826IO_312R.EXE” in the “IO-Lib(NT)” folder. Set it up according to the following procedure.

1. Extracting the file
   Specify the destination for extracted files in the following screen and select “OK”.



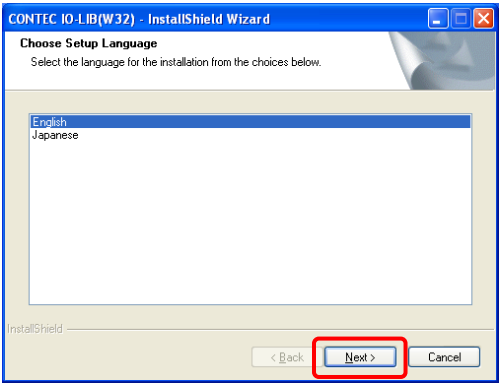
2. File Directory
   In the destination folder for the extracted files, files will be created using the following directory structure.

```
Specification folder
      ├──APIPAC
      ├──INF
      └──Readme
```

3. Install file
   Execute setup.exe in the subfolder “¥APIPAC¥Runtime¥IOLIB¥Disk1” within the specified folder.

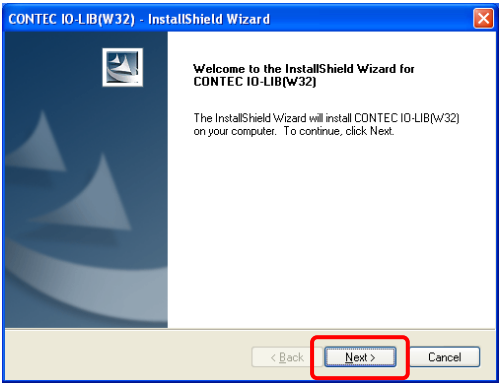
4. Language select

Select a language and click “Next”.



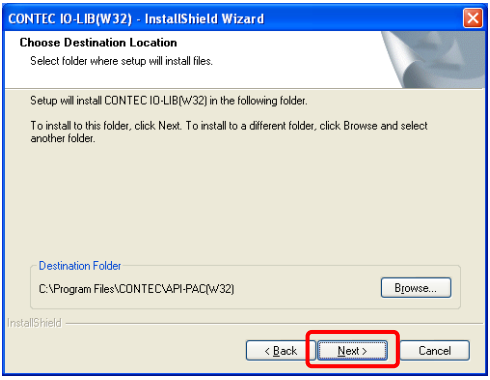
5. Setup

Click “Next”.



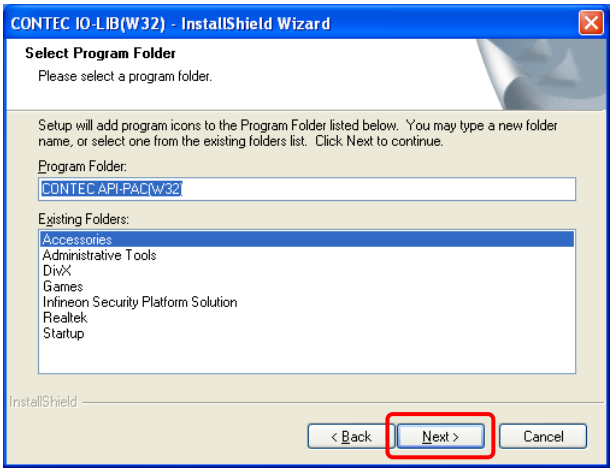
6. Choose destination location

Specify a destination folder for installation and click “Next”.



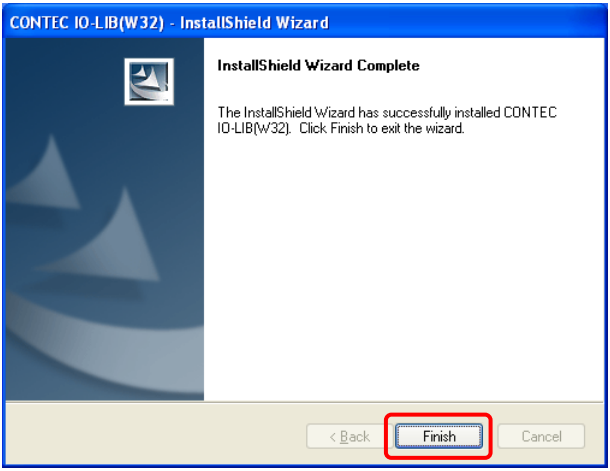
7. Program folder

After specifying the program folder, click “Next”.



8. Completion

Click “Finish”. After clicking “Finish”, restart the PC.

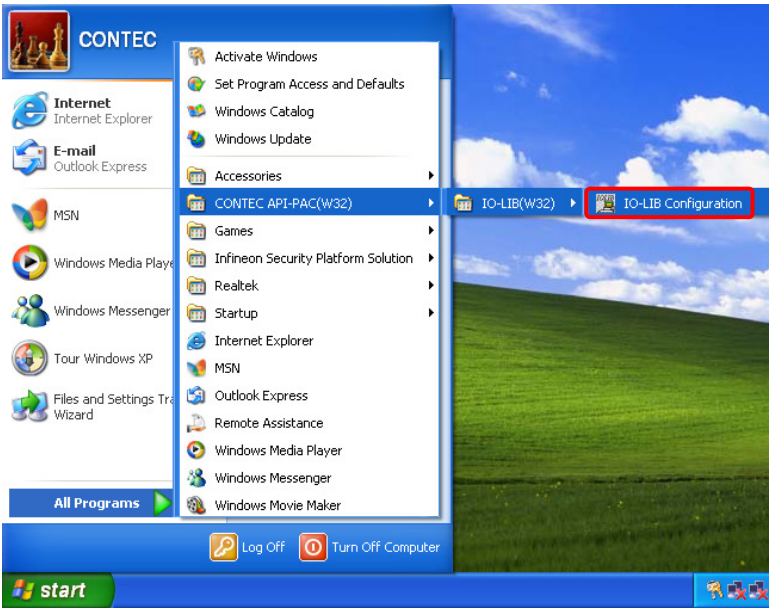


Install of IO-Lib(NT) has been completed.

Set it up according to the following procedure after IO-Lib installed.

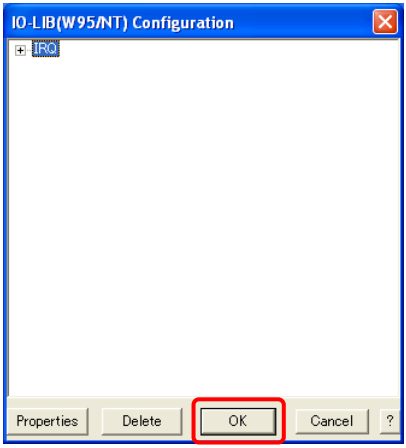
9. Starting the IO-Lib(NT)

Selects “Start menu” - “All Programs” - “CONTEC API-PAC(W32)” - “IO-LIB(W32)” - “IO-LIB Configuration” to start IO-Lib Configuration.

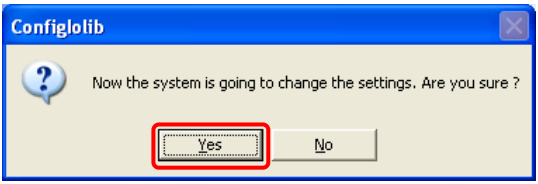


10. IO-Lib(W95/NT) Configuration

Click “OK”.



11. Set registration
Click “OK”.



12. Completion
Click “OK”. After clicking “OK”, restart the PC.



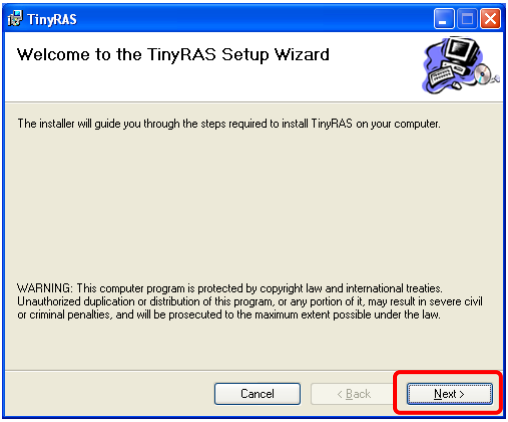
Setup of IO-Lib(NT) has been completed.

RAS tool

The RAS tool can be installed using the “TinySetup.msi” in the “TinyRAS” folder. Set it up according to the following procedure.

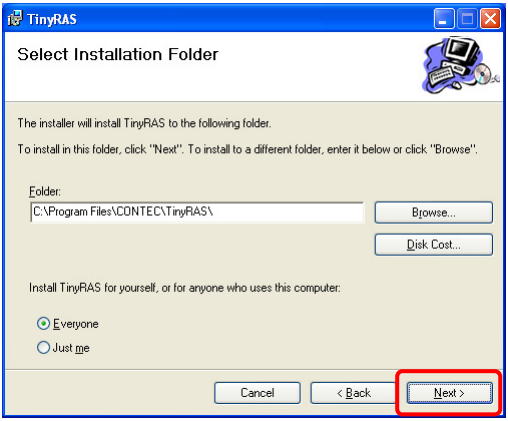
1. Setup

Click “Next”.



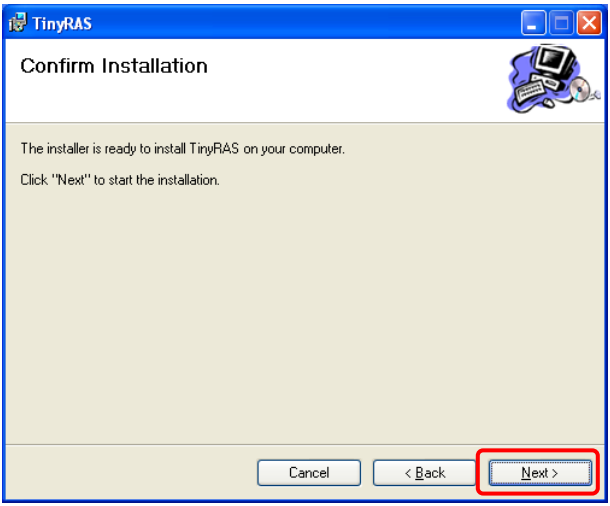
2. Select installation folder

Select the installation destination and one of the RAS user options. Click “Next”.



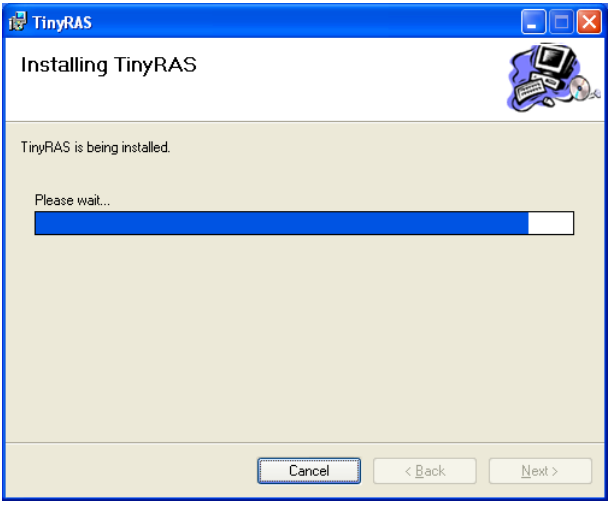
3. Confirm installation

Click “Next”.



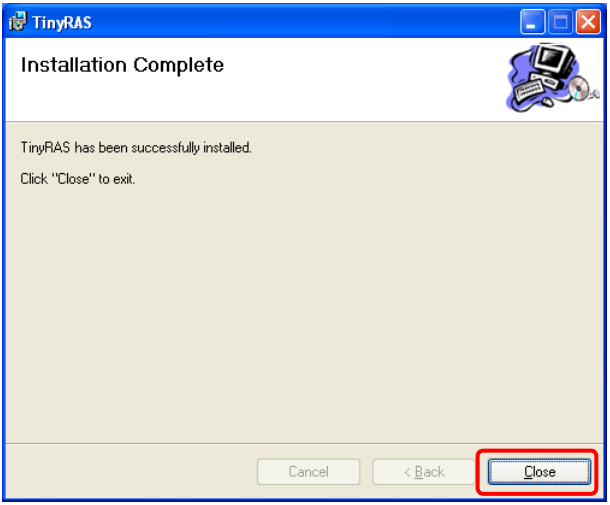
4. Install

Installation is in progress. Completion takes some time. Wait for a while.



5. Completion

Click “Close”. After clicking “Close”, restart the PC.

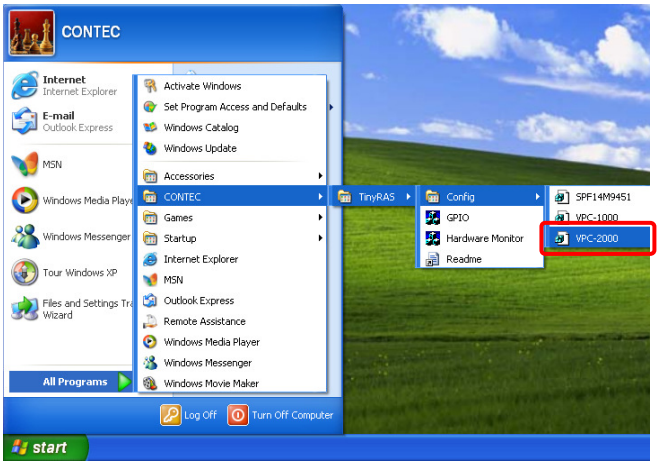


Install of RAS tool has been completed.

Set it up according to the following procedure after RAS tool installed.

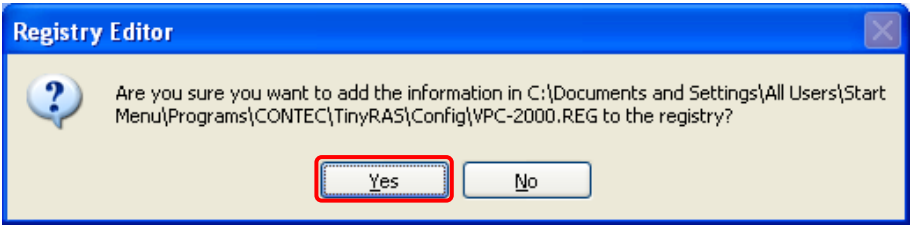
6. Selecting the registry

Selects “Start menu” - “All Programs” - “CONTEC” - “Config” - “VPC-2000” to execute the registry.



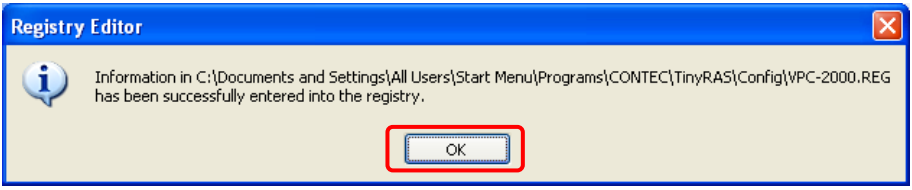
7. Registry addition

Click “Next”.



8. Completion

Click “OK”. After clicking “OK”, restart the PC.



Setup of RAS tool has been completed.

◆Watch-Dog Timer (WDT) Setting

You can set a watchdog timer by using tRasWdtmr function. Execute this function periodically and program it so that the watchdog timer will not be reset.

Prototype of function

```
int  tRasWdtmr ( DWORD  second )
```

Argument	Reset time (in seconds) of the watchdog timer can be set. Input range is 0～255. When 0 is specified, the watchdog timer is deactivated.
Return value	Returns 0 when execution of the function succeeds and a value other than 0 when it fails.
Explanation	Although the time can be set in seconds by using this function, there is an error margin of three seconds in the reset time of the watchdog timer. For example, if the reset time of a watchdog timer is set to 30 seconds later, you have to reconfigure a watchdog timer within 27 seconds. When the watchdog timer is reset, data being written to storage is not guaranteed. As Windows cannot handle shutdowns, if Windows is writing system data, Windows system files may be corrupted.

Header file	TinyRAS.h
Inport library	TinyRAS.lib
DLL file	TinyRAS.dll

The header file and the library file are stored in the place specified when TinyRas is installed. （Initial storage place： c:\Program Files\CONTEC\TinyRAS\ ）

Example programming

```
#include    “TinyRAS.h”
int  main ( void ){
    tRasWdtmr(10);      // The watch-dog timer after ten seconds resets it.
    return 0;
}
```

◆Hardware monitor

You can monitor hardware information such as voltage information, temperature information, and the number of fan revolutions, by using the tRasHwMon function.

Prototype of function

```
int  tRasHwMon ( HMVAL *val );
```

Argument	Specifies the first pointer to the HMVAL structure. ※ The HMVAL structure is defined in the TinyRAS.h file.
Return value	Returns 0 when execution of the function succeeds and a value other than 0 when it fails.

Header file	TinyRAS.h
Inport library	TinyRAS.lib
DLL file	TinyRAS.dll

The header file and the library file are stored in the place specified when TinyRas is installed. （Initial storage place： c:\ Program Files\CONTEC\TinyRAS\ ）

⚠CAUTION

- CPU temperature values given by the hardware monitoring function installed in the VPC-1000 series will vary according to the stepping of the installed CPU.

  Since the bundled software corrects the value according to the CPU, there is no problem. However, if you use the hardware monitoring function through direct hardware access or the standard Windows API, give consideration to the value variations for each CPU.
- If a fan is replaced with service parts, fan speed may be different.

```
/*++++++++++++++++++++++++++++++++++++++++++++

          Values obtained through the hardware monitoring function

++++++++++++++++++++++++++++++++++++++++++++*/
typedef struct  {
        DWORD       f_cpu;                          //        CPU Fan
          DWORD     f_sys;                          //        chassis Fan
          DWORD     f_misc1;                        //        Other Fan1
          DWORD     f_misc2;                        //        Other Fan2

          float     t_cpu;                          //        CPU Temperature
          float     t_sys;                          //        System Temperture
          float     t_misc;                         //        Other Temperture

          float     v_cpu;                          //        CPU Core Voltage
          float     v_mem;                          //        Memory Voltage
          float     v_vcc3;                         //        VCC 3.3V
          float     v_vcc5;                         //        VCC 5V
          float     v_p12v;                         //        +12V
          float     v_m12v;                         //        -12V
          float     v_m5v;                          //        -5V
          float     v_5vsb;                         //        5V Stanby
          float     v_3vsb;                         //        3V Stanby
          float     v_batt;                         //        Battery
}HMVAL, *pHMVAL;
```

Example programming

```
#include  <stdio.h>
#include  <string.h>
#include   "TinyRAS.h"
int  main ( void ){
    HMVAL  val;
    (void)memset(&val, 0, sizeof(val));
    (void)tRasHwMon(&val);
    printf("CPUtemperature %.1f℃¥n", val.t_cpu) ;
    printf("CPUvoltage %.1f[V]¥n", val.v_cpu) ;
    printf("CPUFan %d[rpm]¥n", val.f_cpu) ;
    return 0 ;
}
```

⚠CAUTION

Set the threshold value optionally. (例: Sound an alarm for excessive temperatures, etc…)

◆General purpose input

tRasIoRead functions allow you to get the status of General PurposeI/OPort.

Prototype of function

General Purpose Input　　BYTE　tRasIoRead (BOOL isRead);

Argument　If TRUE is specified, gets the status of the general-purpose input port.
If FALSE is specified, gets the status of the general-purpose output port.

Return value　Returns byte data from a port specified by an argument.

For the general purpose input(isRead=TRUE)

bit	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	I03	I02	I01	I00

汎用出力(isRead=FALSE)の場合

bit	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	D03	D02	D01	D00

※ D02(LED1) and D03(LED2) are allocated to the two front LEDs.

Header file　TinyRAS.h
Inport library　TinyRAS.lib
DLL file　TinyRAS.dll

The header file and the library file are stored in the place specified when TinyRas is installed. （Initial storage place： c:\Program Files\CONTEC\TinyRAS\ ）

Example programming

```
#include  <stdio.h>
#include   “TinyRAS.h”
int  main ( void ){
    BYTE  dat=0;
    dat = tRasIoRead(TRUE);                // Acquiring the state of input port.
    printf( “the state of input port %02X¥n”, dat);
    return 0;
 }
```

◆General purpose output

The tRasIoWrite function allows you to control the general-purpose output port.

Prototype of function

General Purpose Output　　int tRasIoWrite (BYTE data);

Argument　Specifies data output to the general-purpose output port.

Output data corresponds to the following bits.

bit	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	DO3	DO2	DO1	DO0

※ DO2(LED1) and DO3(LED2) are allocated to the two front LEDs.

Return value　When succeeding in executing the function, the specified data is returned.
When failing, the error code is returned.

Header file　TinyRAS.h
Inport library　TinyRAS.lib
DLL file　TinyRAS.dll

The header file and the library file are stored in the place specified when TinyRas is installed. （Initial storage place： c:\Program Files\CONTEC\TinyRAS\ ）

Example programming

```
#include  “TinyRAS.h”
int  main ( void ){
    BYTE  dat=0;
    dat = tRasIoRead(FALSE);
    (dat & 0x08) ? dat &= ~0x08 : dat |= 0x08;  // LED:ON→OFF, OFF→ON
    (void)tRasIoWrite(dat);
    return 0;
}
```

Hardware RAID monitoring tool

This sections describes the utility which monitors the status of HDDs connected to a mirror card. However, in order to use the utility described in this document, the following utilities need to have been installed in Windows.

・IO-Lib ← To install this utility, refer to this chapter “Software Utility”.

・TinyRAS ← To install this utility, refer to this chapter “Software Utility”.

⚠CAUTION

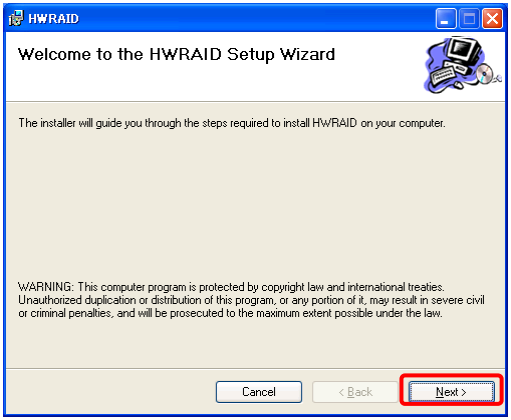
The latest version utirity downloads from CONTEC web site.

◆Setup

The hardware raid monitoring tool can be installed using the “hwRaid.msi” in the “HWRAID” folder. Set it up according to the following procedure.

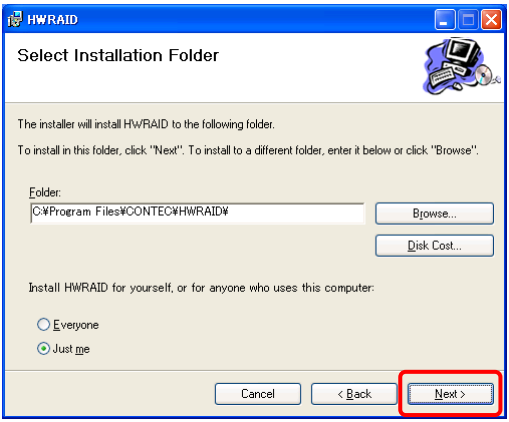
1. Setup

Click “Next”.



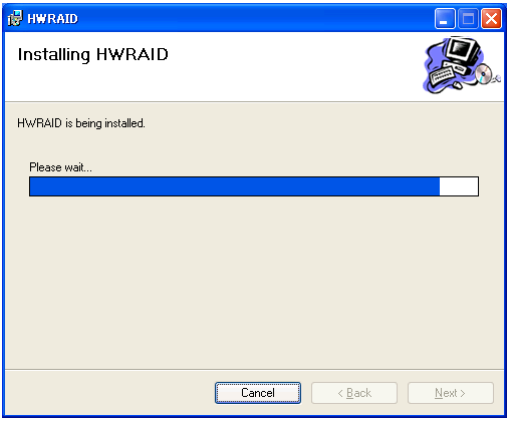
2. Select installation folder

Select the installation destination and one of the monitoring tool user options. Click “Next”.



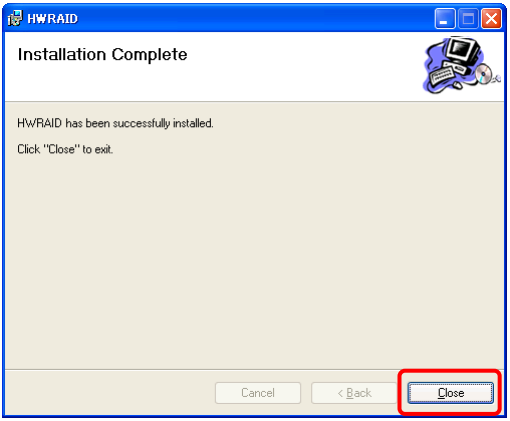
3. Install

Installation is in progress. Completion takes some time. Wait for a while.



4. Complete

Click “Close”. Click “Close”. After clicking “Close”, restart the PC.



Install of the monitoring tool has been completed.

◆Specification

Table 6.1 Tool Functional Specification

	Function	Default operate	Setting range
Status supervision	Watch interval	10min	1 ～ 65535 (sec)
State notification	LED notification ※1	None	Check・None
	Balloon notification	None	Check・None
	Dialog	None	Check・None
State record	Log	Event log	Event log・Text

※1 In this product, it doesn't use LED function.

[Limitations]

- ✓ It's function depends on the user's logon status. (It does not operate as a Windows service.)
- ✓ If the time between occurrence of a status change and return to normal is within the monitoring cycle, the status will not be detected.
- ✓ The log output to an event log requires an active event log service.
- ✓ If the install pass is different from selected installation folder, messages to the event log will not be output properly.

◆Starting the monitoring tool

Execute hwRaid.exe. Optional strings can be specified through the command prompt or the shortcut to hwRaid.exe.

※ For command options, refer to the information under “Command Options”.



Figure 6.1 Starting the monitoring tool

⚠CAUTION

When Windows 7 is used, put a check into “Run this program as an administrator” in Compatibility Tab of hwraid.exe’s Properties, and start the monitoring tool.

◆Exit the monitoring tool

Right-click on the system tray icon to exit the utility.

Select “Exit” of the menu.



Figure 6.2 Exit the monitoring tool

◆Status

When “View Status” is selected, the following dialog appears.
(This is the same as the screen displayed through command option /status/dialog.)

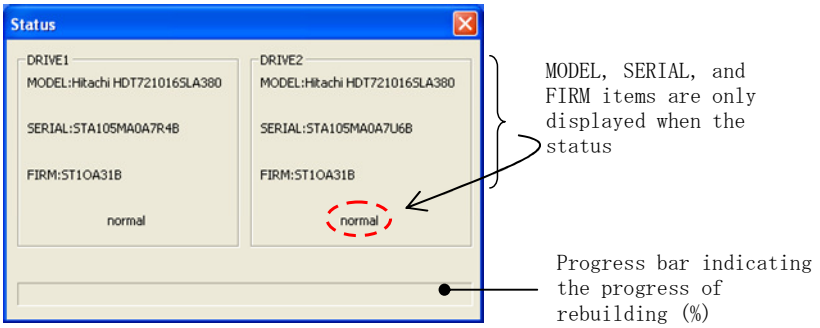


Figure 6.3 Status

◆Version

You can check the version information and start-up options of the monitoring tool.



Figure 6.4 Version

◆Automatic start

When Windows XP Pro and Windows 7 Pro is used, create a shortcut to hwRaid.exe in the following folder.

[Start memu]→[All programs]→[Startup]

◆Command option

You can modify operation through the following command options.

Table 6.2 Command option

Option	Content of operation
/status	Displays only a dialog for status checks without staying resident in the system tray. This dialog is identical to the one which can be displayed through the system tray icon. If the utility does not stay resident in the system tray, events are not output.
/logtext={file pass}	Changes the log output destination to the specified file. When this option is specified, there is no output to the event log. Specify this if you are going to execute an event log service in a situation where one cannot be started.
/interval={Figure [sec]}	Changes the monitoring interval of the RAID status to the number of seconds specified. (default setting: ten minutes intervals) (Input range) 1 to 65535 seconds
/drivenum={Figure}	Specifies the drive number (0 or higher) of the RAID board. Unless specified, the board functions as drive number 0. You can check the drive number through Windows “Disk Management”.
/balloon	This enables the display of a balloon pop-up from system tray icon when failure is detected.
/led	This enables LED output when failure is detected. ※1
/dialog	This enables an automatic dialog popup when failure is detected.

※1 In this product, it doesn't use/led.

Execution example : (□:Space)
hwRaid.exe□/interval=10□/balloon□/led□/logtext=C:¥Windows¥Temp¥raid.log

<Notes on /status option.>

If the “View Status” dialog appears with this option specified, the following restrictions are imposed.

- ✓ Task tray icon : Not displayed (A program does not stay resident.)
- ✓ State notification functional : Invalidity
- ✓ Log functional : Invalidity
- ✓ Watch cycle : Fixation for 10sec

◆Log functional

[Event log]

The log is output to the event viewer application.

Table 6.3 Event log Status

Item	State
Warning	✓ Reading error the drive 1 ✓ Reading error the drive 2
Error	✓ The drive 1 in fault ✓ The drive 2 in fault ✓ The drive 1 and 2 in fault ✓ Unknown error
Information	✓ Return ✓ Rebuilding the drive 1 ✓ Rebuilding the drive 2 ✓ Restoring ✓ Starting at the tool

[Text log]

The text log function is only valid when a valid output file is specified through the /logtext option. It appends the data to the specified file. It does not provide functionality for changing the destination file or setting a ceiling on log entry count.

The delimiter is “comma” (fixed). It outputs the log to the specified file in the following format.

Time stamp, Division, Content of log

✓ Time stamp yyyy/mm/dd (Year/Month/Day) □HH:MM:SS (Hour:Minutes:Seconds)

※ A half-width space “□” is included between year, month, day, hours, minutes, and seconds.

✓ Division INFO, WARN, or ERR

※ The text log function is output in English regardless of the OS language environment.

(Output example)

2009/01/29 01:23:45, INFO, Start RAID Monitoring.

[Notes]

At output of the Event log and text log, Error dialog might be displayed.

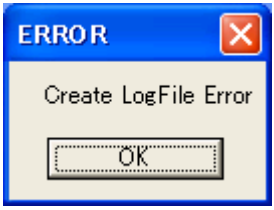


Figure 6.5 Error dialog

When error dialog is displayed, checks along the log output.

・Event log output

Checks the log setting by the property of event log application.

・Text log output

Checks the log output destination.

◆API library Specification

GetRaidStatus and GetRaidProgress functions allow you to get the status of hardware RAIDs.

Library files are installed in the same directory as the tool.

●GetRaidStatus

Table 6.4 RAID status

WORD GetRaidStatus(int Port, int *iError);	
Functional	A function to get the operating status of hardware RAIDs.
Argument	The first argument Port Specify the disk number (0 or higher) comprising the RAID. This number can be checked through “Disk Management (diskmgmt.msc) in Windows. The second argument *iError Specify a pointer to the int variable storing run-time errors. If you do not have to get the execution result of the function, specify a NULL pointer. One of the following fixed values is stored. ✓ **RAIDLIB_ERROR_SUCESS** The function was executed successfully. ✓ **RAIDLIB_ERROR_OPEN** The device cannot be opened. ✓ **RAIDLIB_ERROR_READ** Data cannot be read. ✓ **RAIDLIB_ERROR_CLOSE** The device cannot be closed.

Return value	Returns one of the following fixed values. ✓ **RAIDSTS_INACCESSIBLE** Unable to access the RAID status. refer to iError. ✓ **RAIDSTS_NORMAL** RAID status is normal. ✓ **RAIDSTS_DRIVE1_BROKEN** A problem has occured with Drive 1. ✓ **RAIDSTS_DRIVE2_BROKEN** A problem has occured with Drive 2. ✓ **RAIDSTS_DRIVE1_REBUILD** Drive 1 is being rebuilt. ✓ **RAIDSTS_DRIVE2_REBUILD** Drive 2 is being rebuilt. ✓ **RAIDSTS_DRIVE1_ERROR** It failed in the rebuild of Drive 1. ✓ **RAIDSTS_DRIVE2_ERROR** It failed in the rebuild of Drive 2. ✓ **RAIDSTS_VERIFY_CHECK** Restoring.
Explanation	RAIDSTS_DRIVE(x)_ERROR Indicates that data from a source drive coulding not be read in the rebuild. (Read error) At detection, restore it. RAIDSTS_BROKEN Indicates the restore coulding not be restored.
Remarks	Necessary header file：RaidLib.h Static link library：RaidLib.lib Dynamic link library：RaidLib.dll、smart.dll

Table 6.5 RAID progress

int GetRaidProgress (int Port, int *iError)	
Functional	A function to get the progress of rebuilding.
Argument	The first argument Port Specify the disk number (0 or higher) comprising the RAID. This number can be checked through “Disk Management (diskmgmt.msc) in Windows. The second argument *iError Specify a pointer to the int variable storing run-time errors. If you do not have to get the execution result of the function, specify a NULL pointer. One of the following fixed values is stored. ✓ **RAIDLIB_ERROR_SUCESS** The function was executed successfully. ✓ **RAIDLIB_ERROR_OPEN** The device cannot be opened. ✓ **RAIDLIB_ERROR_READ** Data cannot be read. ✓ **RAIDLIB_ERROR_CLOSE** Data cannot be close.
Return value	-1: Error: Could not get progress. refer to iError. 0 or higher: Indicates rebuilding progress % (percent).
Explanation	When you get RAIDSTS_DRIVE(x)_REBUILD or RAIDSTS_DRIVE(x)_VERIFY_CHECK by the RaidGetStatus function, you can get the rebuilding progress by executing this function.
Remarks	Necessary header file : RaidLib.h Static link library : RaidLib.lib Dynamic link library : RaidLib.dll、smart.dll

Chapter 7 Software RAID setup

This chapter describes software mirroring (RAID1) setup. We only support mirroring. We do not support operation for other RAIDs (RAID0, RAID5, and RAID10). Be aware that functions not supported are outside the scope of the warranty.

Software RAIDs are not hot-swappable.

⚠CAUTION

If RAID settings are changed, all data on the hard disks will be erased.

Back up necessary data in advance.

Starting the setup screen

Before starting the RAID utility, set the IDE device to RAID in the BIOS setup described in Chapter 3. Press the <CTRL> and <I> keys on the following screen to start the RAID utility. After a few seconds, the RAID utility can be started.

```
Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D vRAID5
Copyright(C) 2003-09 Intel Corporation. All Right Reserved.

 RAID Volumes:
 ID     Name        Level    Strip    Size   Status        Bootable

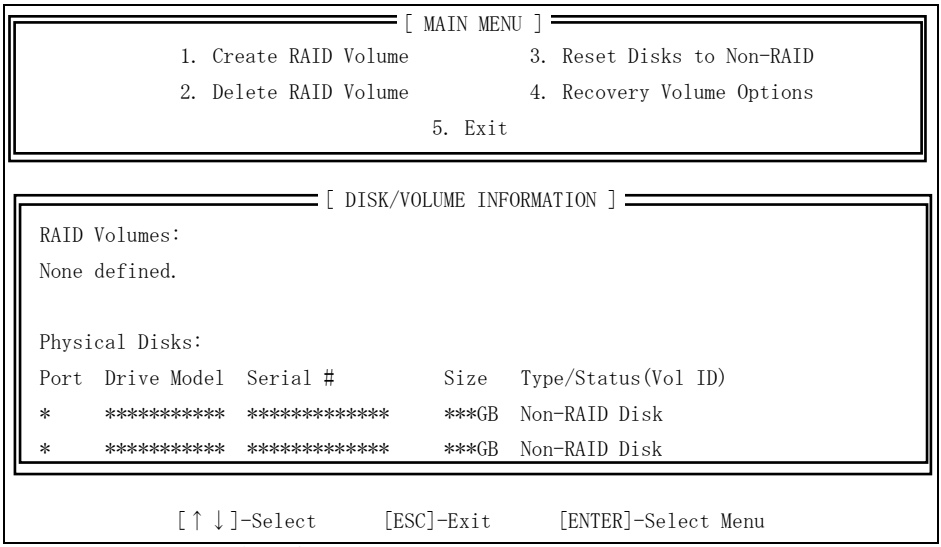
 Physical Disks:
 Port  Drive Model  Serial #          Size   Type/Status(Vol ID)
 *     **********  **********        ***GB  Non-RAID Disk
 *     **********  **********        ***GB  Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility..
```

⚠CAUTION

If the IDE device is not set to RAID in the BIOS setup, the above screen will not appear.

Main Window

When you start the RAID utility, the main window appears.

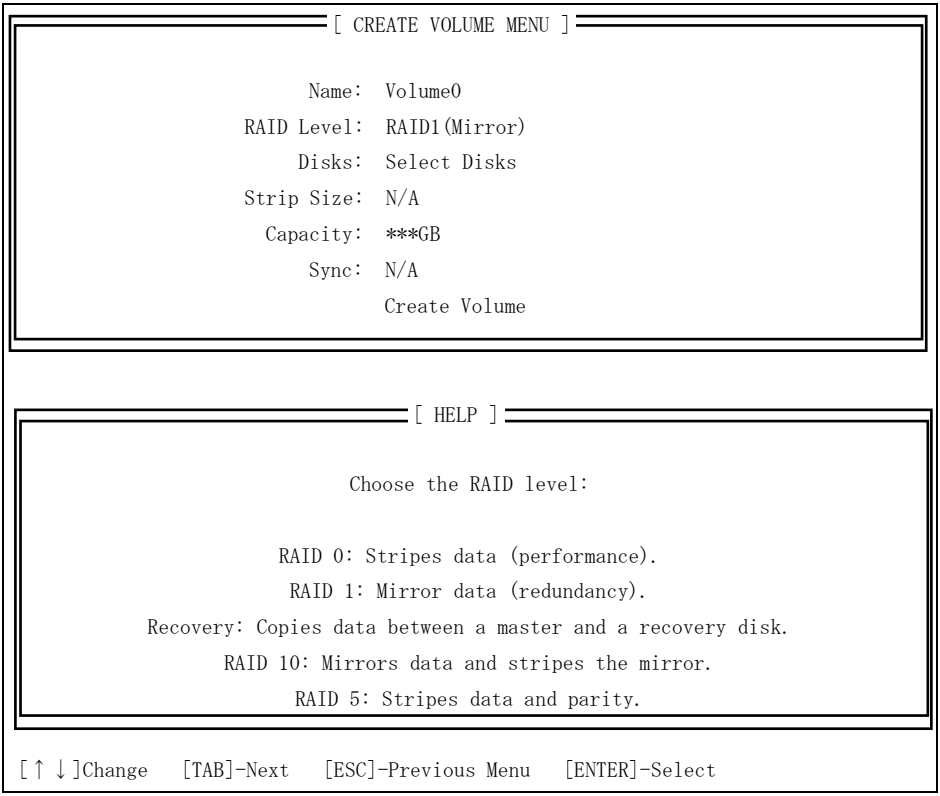


1. The cursor keys <↑>, <↓>, <→>, <←> allow you to navigate through menu items and the <Enter> key allows you to choose among them.
   (You can also select items by entering menu numbers 1 to 4 with the keyboard.)
2. You are prompted to confirm that you are saving the current settings. Press the <Y> key to save them and press the <N> or <ESC> key to exit the RAID utility without saving them.

- RAID Volume : Displays the type, volume, and status of the created RAID drive.
- Physical Disks : Displays hard disks which will be the target of the RAID drive.

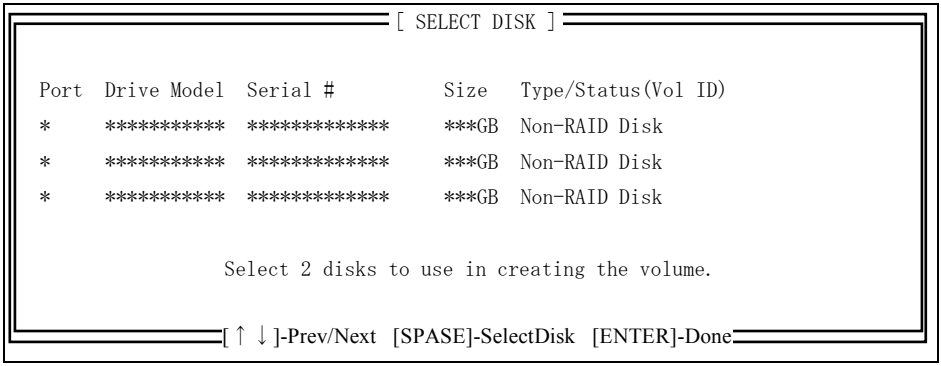
- ➢ Create RAID Volume : A RAID drive can be created. The type and capacity of the created RAID drive can be set when it is created.
- ➢ Delete RAID Volume : An existing RAID drive can be deleted. If deleted, data will be lost.
- ➢ Reset Disk to Non-RAID : The RAID configuration of the selected hard disk can be cleared.
  If the RAID configuration uses system drive, then after clearing it, the OS will be unable to boot.
  ※The VPC-2000 series does not use this.
- ➢ Recovery Volume Option : Master drive or Recovery drive can effectively set.
  ※However, when the kind of the RAID drive is only Recovery, it is possible to set it.
- ➢ Exit : Exit RAID utility.

Create RAID drive (Mirroring)



1. Select “Create RAID Volume” by pressing the <Enter> key or the <1> key in the Main window.
2. The <TAB> key and the <Enter> key allow you to navigate through items.
3. Select “RAID1(Mirror)” by pressing the <↑> and <↓> keys for the “RAID Level” setting and press the <TAB> key or the <Enter> key to confirm the setting.

The number of HDDs necessary for setting “RAID1(Mirror)” for the “RAID Level” setting is two. If only two HDDs are connected, the “Disks” setting cannot be selected, so go to step 7. If more than two HDDs are connected, it will be necessary to set up the HDDs comprising a mirroring RAID drive on the following screen, so proceed to step 4.



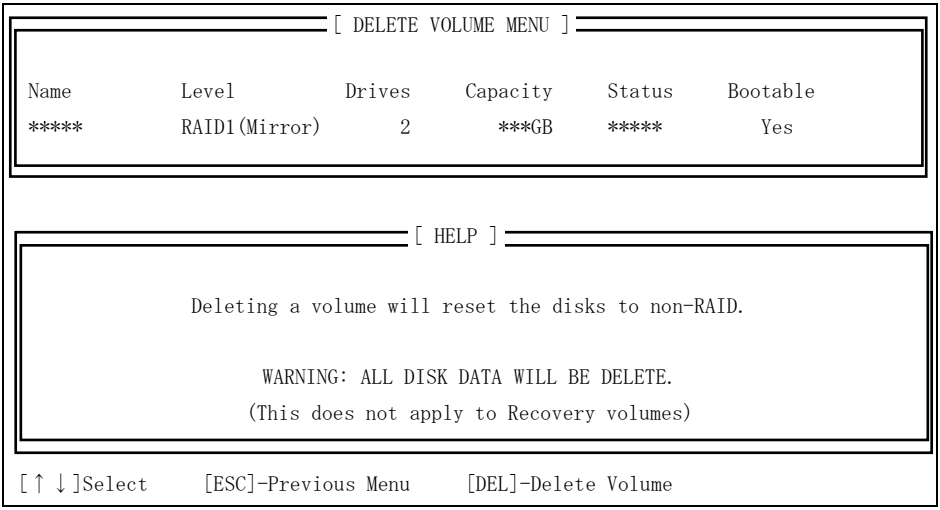
4. Select the “Select Disk“ setting by pressing the <Enter> key, and select the HDDs comprising the RAID drive by pressing the <SPACE> key.
5. Press the <Enter> key to close the “SELECT DISKS” window.
6. You can optionally configure other settings. “Name” and “Capacity” can be set by keyboard entry.
7. Once setting up the RAID drive is complete, press the <Enter> key with “Create Volume” selected.
8. When you are prompted to confirm that you are creating a RAID drive, press the <Y> key.
9. A RAID drive will be created under “RAID Volume” in the Main window. The “Type/Status(Vol ID)” of the HDDs will read “Member Disk”.
10. Press the <↑> and <↓> keys to select “Exit” in the Main window, and confirm your choice by pressing the <Enter> key or the <5> key.
11. When you are prompted to confirm that you are saving the current settings, press the <Y> key to exit the RAID utility.

⚠CAUTION

Mirroring requires the creation of a RAID drive before installing the OS. If a RAID drive is created after installing the OS, data will be lost and the OS will be unable to boot.

Our support is limited to mirroring. Creating a RAID drive other than a mirroring RAID is up to the customer. We assume no responsibility for damage caused by doing so.

Delete RAID drive (Mirroring)



1. Select “Delete RAID Volume” by pressing the <Enter> key or the <2> key in the Main window.
2. When all mirroring-configured RAID drives are displayed, press the <↑> and <↓> keys to move to the RAID drive to be deleted and press the <DEL> key.
3. When you are prompted to confirm that you are deleting the selected RAID drive, press the <Y> key.
4. The RAID drive will be deleted from “RAID Volume” in the Main window. Its “Type/Status” will indicate “Non-RAID Disk”.
5. Press the <↑> and <↓> keys to select “Exit” in the Main window, and confirm your choice by pressing the <Enter> key or the <5> key.
6. When you are prompted to confirm that you are saving the current settings, press the <Y> key to exit the RAID utility.

⚠CAUTION

When an existing RAID drive is deleted, data may be lost. Back up the data on a RAID drive before deleting it if the data is important.

Software RAID monitoring tool(Rapid storage technology)

Rapid storage technology allows you to monitor the information and status of an existing RAID drive or HDDs comprising a RAID drive. Furthermore, as necessary, it allows creating, deleting and reconfiguring of RAID drives.

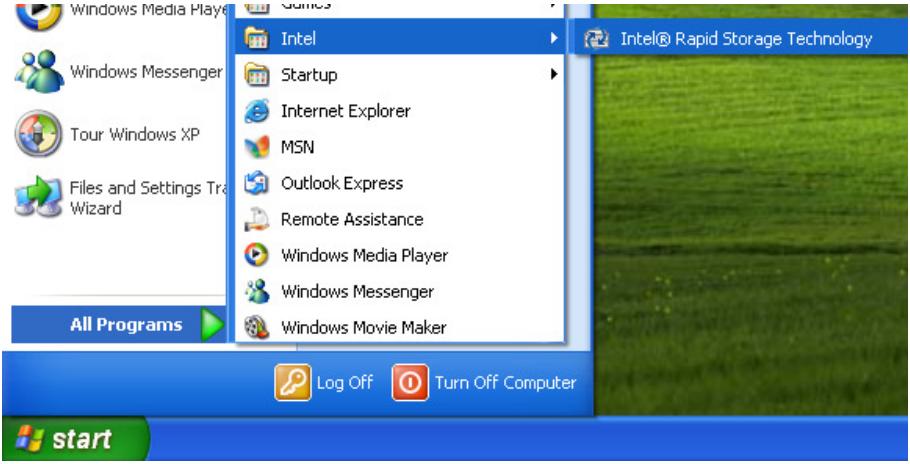
◆Rapid storage technology Install

When the system is recovered using the bundled recovery media, Rapid storage technology will be installed by default.

Uninstalling it is up to the customer.

◆Starting the Rapid storage technology

After installing Rapid storage technology, you can launch it from “Start Menu” - “Programs”.

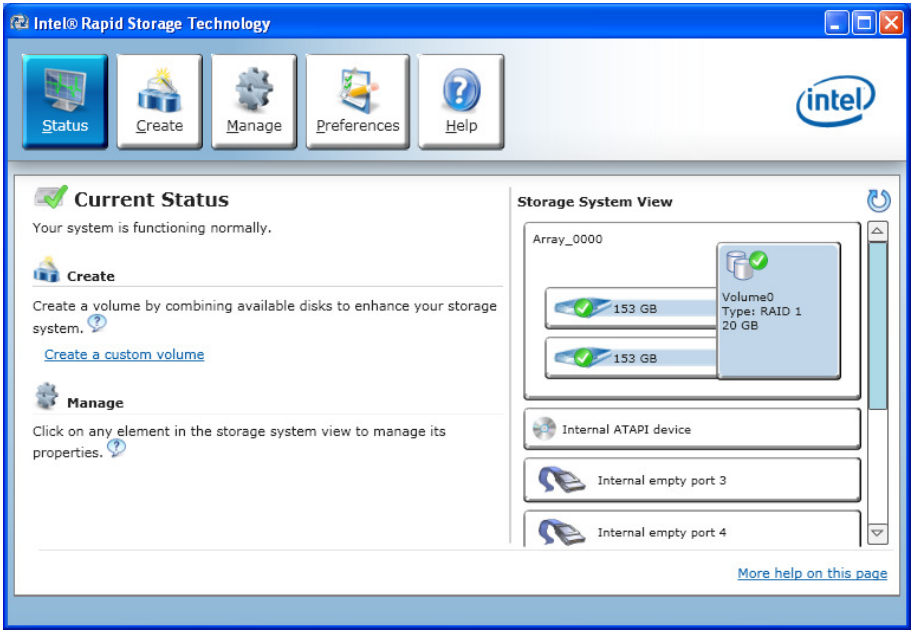


When the contents of Rapid storage technology are updated or activities are in progress internally, an icon is display in the Task Manager. You can also launch it by clicking the icon. Be aware that the icon is not always displayed in the Task Bar.



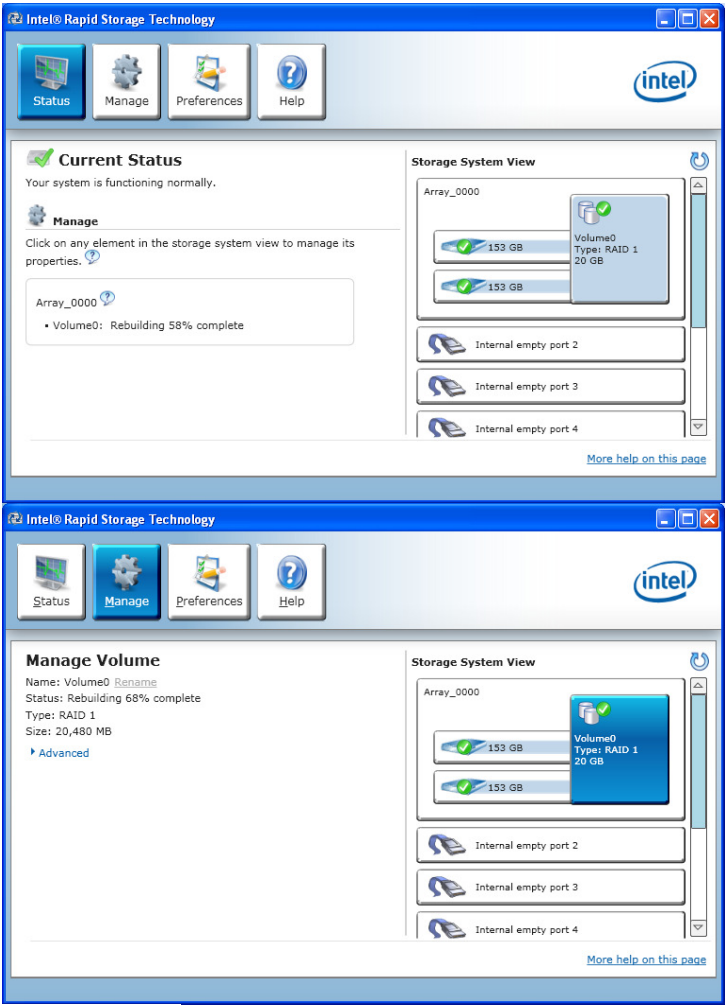
◆Exiting the Rapid storage technology

You can exit Rapid storage technology by clicking “×” on the upper right corner of the window.



◆Making of mirroring synchronize

Data on mirrored drives is compared, and if a difference is found, data on the drives will be copied between HDDs and data on the mirrored drives will be automatically unified.



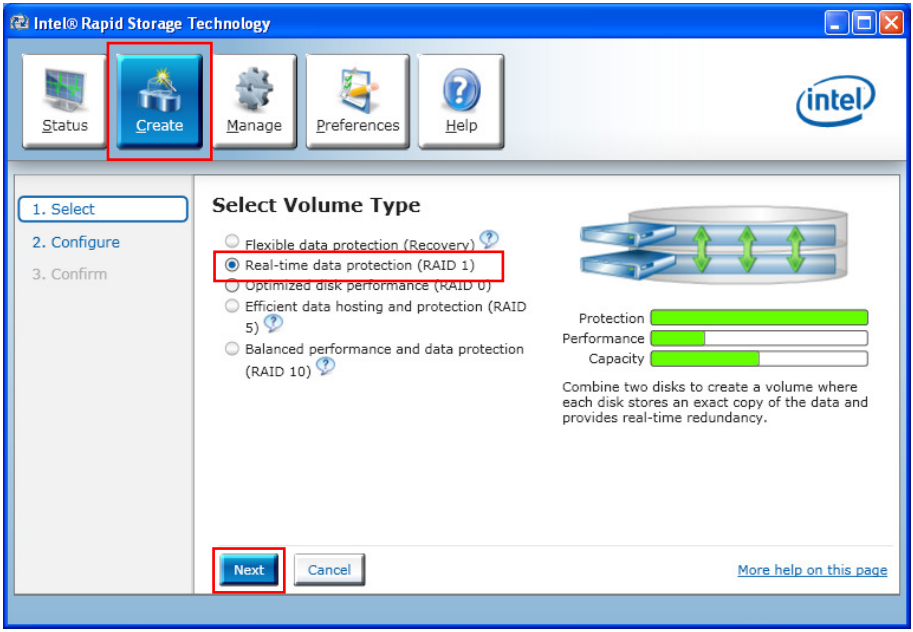
⚠CAUTION

Synchronization by Rapid storage technology cannot be suspended while it is in progress. In addition, you should not turn off the power to the PC while synchronization is in progress. Doing so will cause data loss and data error. If a HDD to be mirroring-configured is not a “Member disk”, you have to set it to be a mirrored drive using the RAID utility or Rapid storage technology.

◆Create RAID drive (Mirroring)

You can create a mirroring RAID drive from Rapid storage technology.

1. Select “Create Volume” on the Array drive.



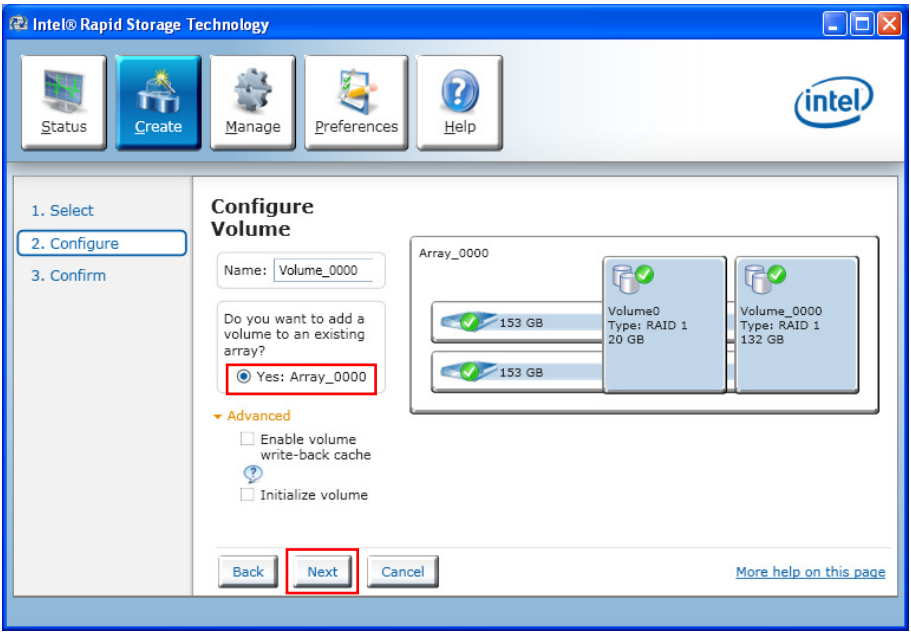
⚠CAUTION

When the RAID drive is made by the total content of HDD 2 piece connected, “Make” item is not displayed.

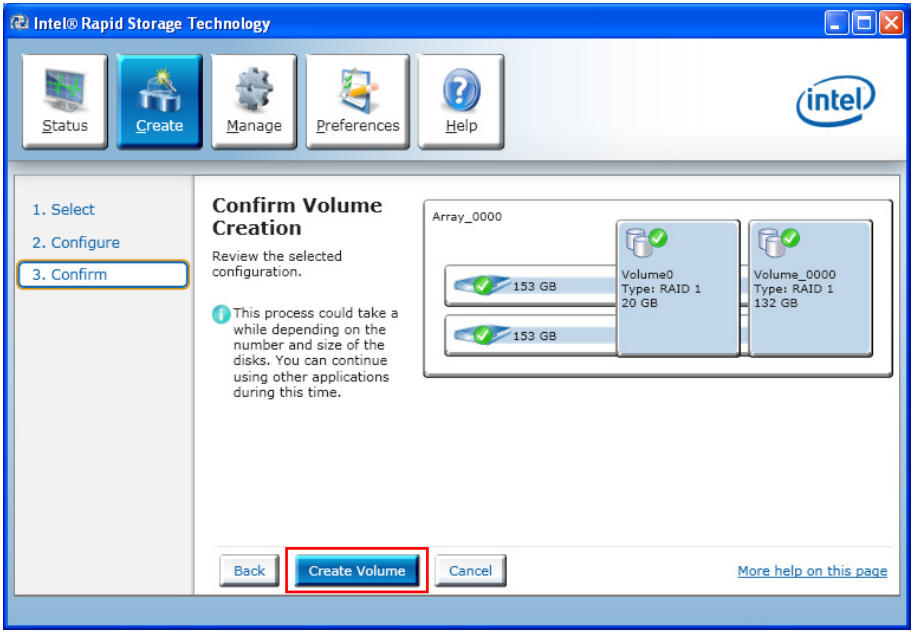
RAID drives which can created are up two drives in total.

2. Check “Real-time data protection (RAID1)” and select “Next”.

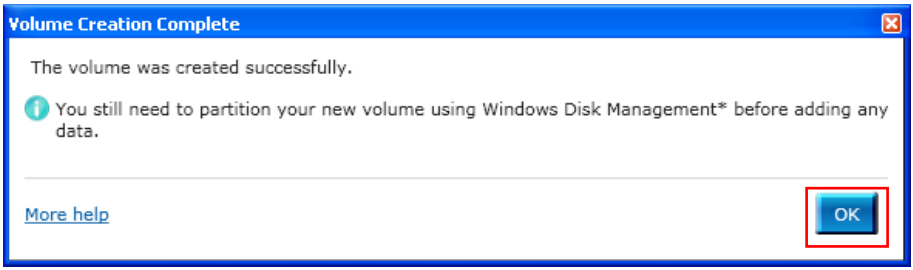
3. Check “Yes:*****” and select “Next”.
   Input Name and Advanced arbitrarity.



4. Select “Create Volume”.



5. After the wizard displayed, selected “OK”.

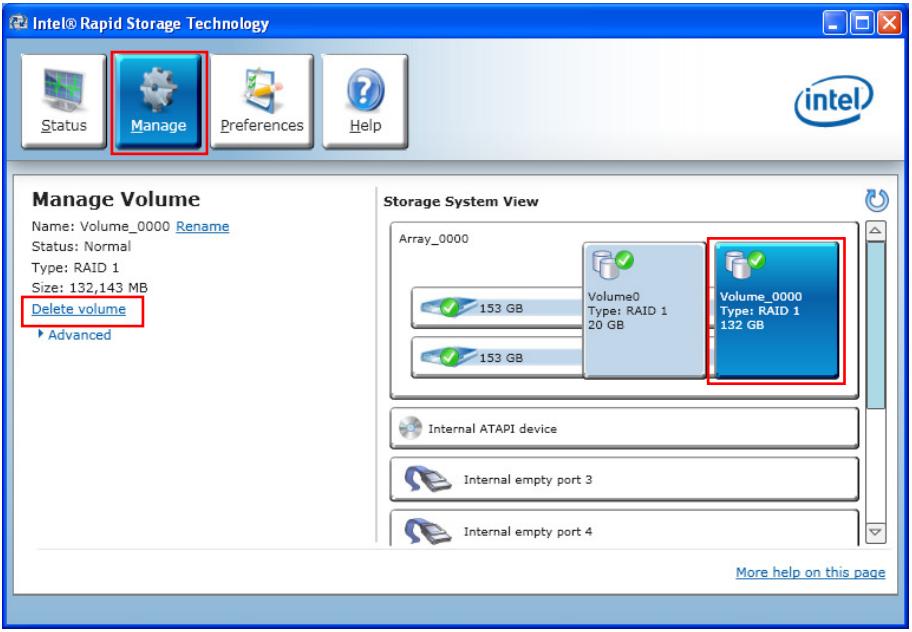


6. When the wizard is finished, a new RAID drive create.

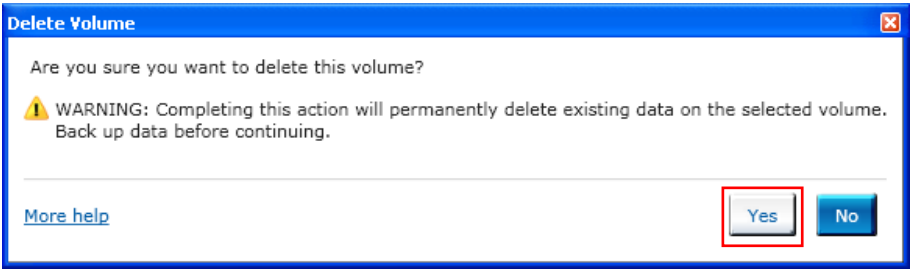
◆Delete RAID drive (Mirroring)

You can delete a mirroring RAID drive from Rapid storage technology.

1. Select “Manage”, select the RAID drive that you want to delete.



2. Select “Delete volume”.
3. After the wizard window is displayed, select “Yes”.



4. The selected RAID drive is deleted.

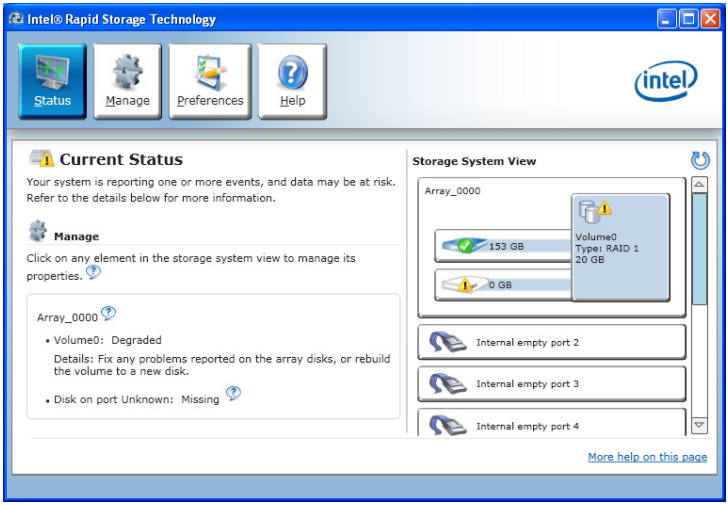
⚠CAUTION

If an existing RAID drive is a system drive, it cannot be deleted.

◆For the error

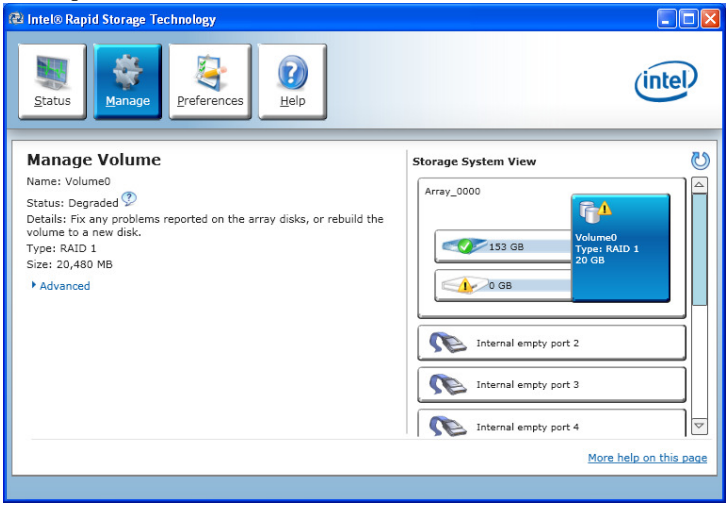
If an error occurs in a RAID drive or a HDD, you can check the status of the Array, the mirroring-configured RAID drive, and the HDD using Rapid storage technology. Each status can be checked through the “Status” or “Management” of Rapid storage technology.

■Status



※One mirroring-configured HDD is not connected.

■Management



※One mirroring-configured HDD is not connected.

Details on errors HDD and RAID drive errors are shown. Repair the RAID drive or replace the HDD optionally in accordance with the type of error.

CAUTION

RAID errors cannot be detected by the application.

Therefore, check for errors using the icon displayed in the status bar.

◆Confirming the error log

When an error occurs in a RAID drive, it is logged into the Windows-standard “Event Viewer”.

You can check errors using the Windows-standard “Event Viewer”.

CAUTION

Rapid storage technology does not provide a logging function.

RAID setup when replacing the HDD

The VPC-2000 series is installed with a RAID-1 Array created. However, if a HDD is replaced, you must reconfigure the mirroring RAID drive in the Array.
Set up the RAID in accordance with the following procedure.

CAUTION

RAIDs in the VPC-2000 series are not hot-swappable. Always turn off the power before replacing a HDD.

1. Replace the HDD and boot the PC.

```
Intel(R) Matrix Storage Manager option ROM v8.9.0.1023 PCH-D vRAID5
Copyright(C) 2003-09 Intel Corporation. All Right Reserved.

 RAID Volumes:
 ID     Name        Level          Strip  Size   Status     Bootable
 0      Volume0     RAID1(Mirror)  N/A    **GB   Degraded   Yes

 Physical Disks:
 Port  Drive Model  Serial #             Size   Type/Status(Vol ID)
 *     **********   ************         ***GB  Non-RAID Disk
 *     **********   ************         ***GB  Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility..
```

2. Press the <Ctrl> and <I> keys in the above screen to start the RAID utility.
   When the RAID utility launches, the following screen will appear with the replaced HDD indicated.

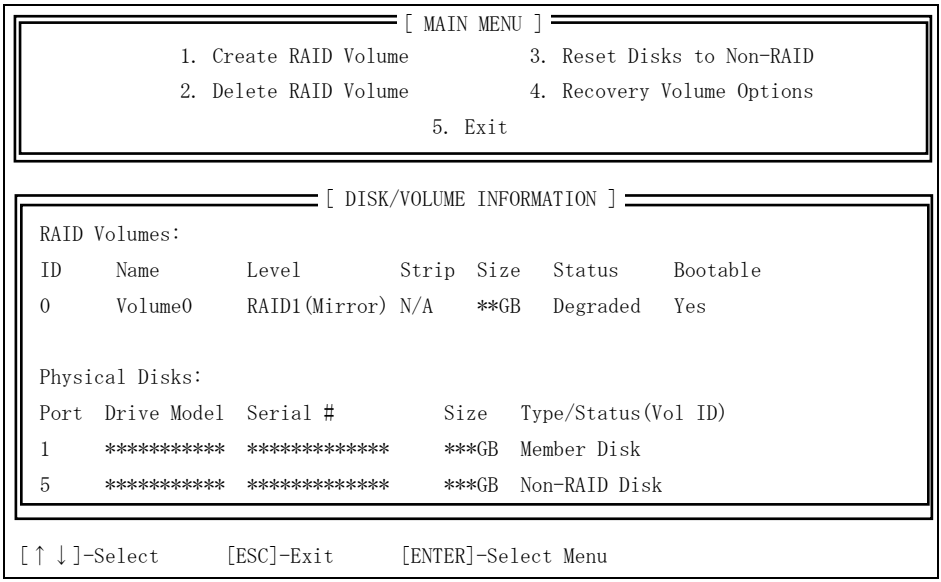
```
                [ DEGRADED VOLUME DETECTED ]

 "Degraded" volume and disk available for rebuilding detected. Selecting
a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):
               Port   Drive   Model          Serial #          Size
               *      *****   **********     **********        ***GB

            [↑ ↓]-Previous/Next  [ENTER]-SelectDisk  [ESC]-Exit
```

3. Move to a mirroring-configured (replaced) HDD by pressing the <↑> and <↓> keys and confirm your choice by pressing the <Enter> key. In the Main window of the RAID utility, the "Status" item under "RAID Volume" item changes to "Rebuild" and the "Type/Status(Vol ID)" item under "Physical Disks" item changes to "Non-RAID Disk".



4. Press the <ESC> or <4> key and the <Y> key in turn to save settings and exit the RAID utility.
5. Boot the OS.
6. When the OS boots, the RAID drive will be automatically synchronized by Rapid storage technology.
7. When synchronization is finished, reconfiguration of mirroring is complete.

In addition to the above procedure, mirroring can be also reconfigured from Rapid storage technology, but we recommend replacement through the above procedure.

For the recovery procedure using Rapid storage technology, refer to the help information for Rapid storage technology.

Chapter 8 Hardware RAID setup

This chapter describes hardware mirroring (RAID1) setup. We only support mirroring. We do not support operation for other RAIDs (RAID0, RAID5, and RAID10). Be aware that functions not supported are outside the scope of the warranty.

Hardware RAIDs are also hot-swappable.

Functional specification

For more on the specifications of RAID boards (hereinafter described as “mirror card”) used for hardware RAIDs, refer to Chapter 2 “General” - “Specification”.

◆Locations and settings of switches and connectors

Once you have removed the case cover, the bracket for the riser card, and the mirror card bracket, you will be able to see the connectors and jumpers as illustrated below.

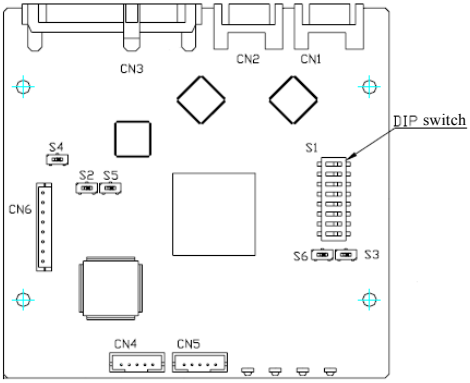


Table 8.1 Switch list

Name	Function	Factory default setting	Reference page	Remarks
S1	DIP switch setting	1～8 all OFF	P120	State usually
S2/S3/S4/S5/S6	S2/S3/S4/S5/S6 switch setting	Right	P120	※1

※1 Use the factory default settings.

Table 8.2 Connector list

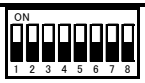
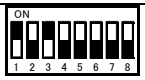
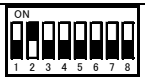
Name	Function	Reference page	Name	Function	Reference page
CN1	Serial ATA connector (HDD1)	-	CN3	Serial ATA connector	-
CN2	Serial ATA connector (HDD2)	-	CN4/CN5/CN6	※2	-

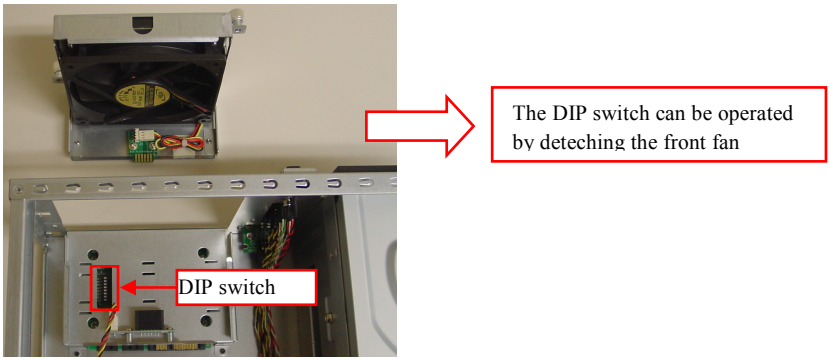
※2 Do not use these.

◆Switch setting

■DIP switch : S1

Table 8.3 DIP switch setting

S1	Function
	State usually (Factory default setting)
	Setting 1 (Reset the information on mirroring configuration)
	Setting 2 (The failure and the Restoration of the sector error)

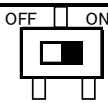


CAUTION

The DIP switch must be set only when the power is off.
In addition, do not set any settings other than those described above.

■S2/S3/S4/S5/S6 switch setting : S2, S3, S4, S5, S6

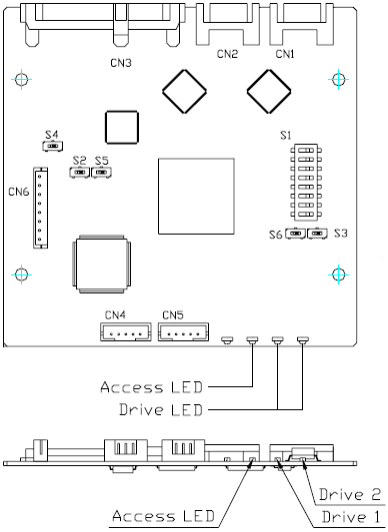
Table 8.4 S2 switch setting

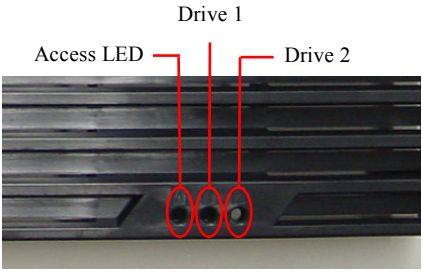
S2	Function
	State usually (Factory default setting)

CAUTION

Use the factory default settings.

◆Internal LED status





Front bezel

Table 8.5 LED status

Operation		Access LED	Drive LED
Boot up		Green lighting	Green lighting
Normal performance		Green lighting※2	Green lighting※1
Faulty			Orange lighting
Rebuilding			Copy destination : Orange blinking Copy original : Green lighting
Copy error			Copy original : Orange blinking Green lighting※1
System hung	Both drives sre hung	Orenge blinking	Turning off
	HDD configuration information is incompatible.	Orange blinking	Green lighting

※1 At the access it lights.

⚠CAUTION

You can see these LEDs from the outside of the chassis.
You can check the status conditions that correspond to these LEDs using a utility.

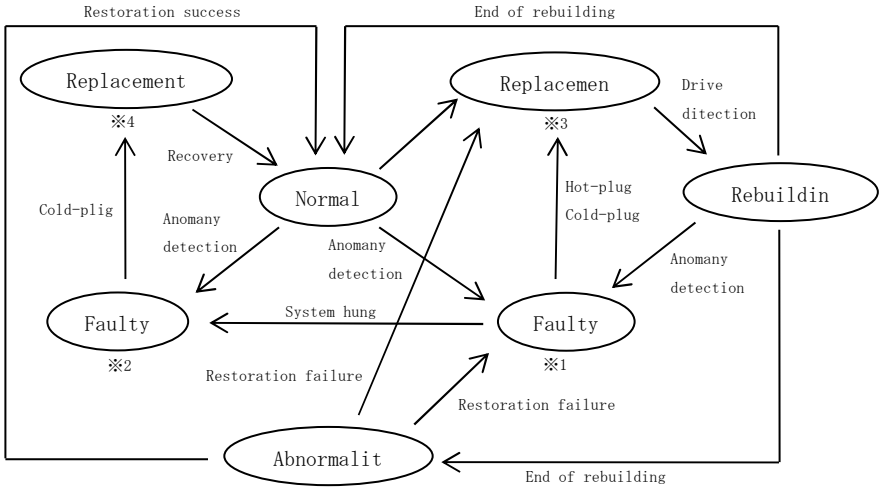
Hardware RAID setup

Information and the state of HDDs that it is existing in the mirroring composition can be observed by the utiliry. Regarding this utility, refer to Chapter 6 “Software utility” - “Hardware RAID monitoring tool”.

The state of HDDs that it is existing in the mirroring composition can be observed by the mirror card LED. Regarding the Mirror card LED, refer to This Chapter “Internal LED status”.

◆Operation flow

During hardware RAID operation, the following conditions are possible, with either condition available.



※1 Of two drives, only one is faulty

※2 Both drives are faulty

※3 Of two drives, only one is replacement

※4 Both drives are replacement

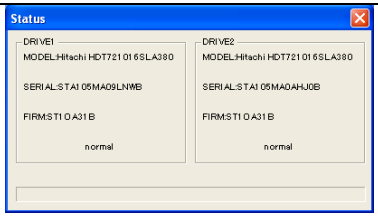
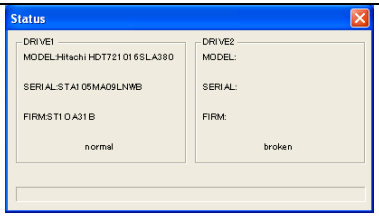
Table 8.6 Mirror card status

Status	Explanation
Normal	Both drives are normal and the system is operating normally. Read from either drive and write the same data to both drives.
Faulty	One drive is faulty and the system remains capable of operation. Two drives are faulty and the system has been deactivated.
Replacement	Replace a faulty drive with a good drive.
Rebuilding	The system is capable of operation while a drive is being rebuilt. When restarting during a rebuild, rebuilding resumes from the last completed block. Replacement of drives is possible in the following two modes. **Hot-plug** Replace a drive during operation of the RAID board (with the power on). Even if the replaced drive is identical to the one prior to replacement, start rebuilding. **Cold-plug** Replace a drive while the RAID board is deactivated (with the power off). If a new drive is not inserted, do not rebuild.
Abnormality	A read error occurs from the source during rebuilding. Write data where a read error occurs from the source.

◆For the error

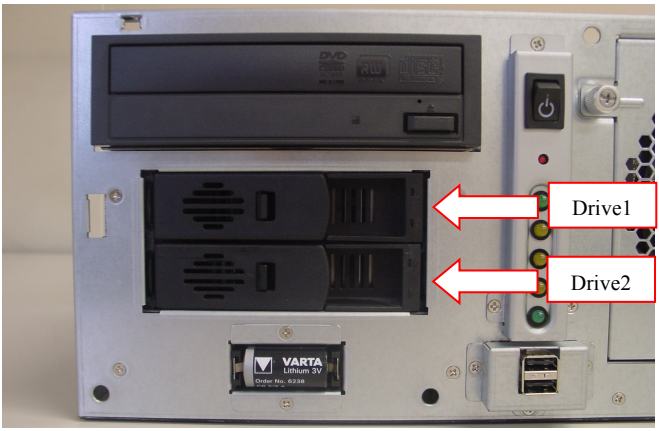
If an error occurs in a mirroring-configured HDD, you can check the status of the HDD using a utility or the mirror card LED. Replace the HDD optionally in accordance with the type of error.

Table 8.7 HDD error

	Normal	Abnormal
Utirity		

※One mirroring-configured HDD (Drive2) not connected

Drive1 and Drive2 in the software utility and on the mirror card correspond to the drive bays illustrated below.



CAUTION

During installation of a HDD and cabling of the mirror card, ensure that they are not turned upside down.

◆RAID setup when replacing the HDD

This section describes the setup for replacing a mirroring-configured HDD. Set it up along the number of exchanged HDD.

⚠CAUTION

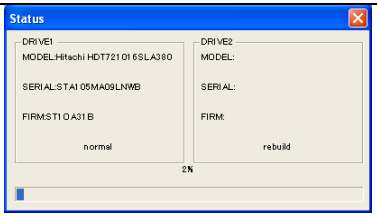
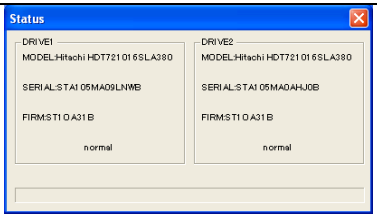
Prepare a HDD for replacement with the same type and capacity.

●When replaced HDD is one

Prepare a good HDD and replace a faulty HDD with it. Regarding replacement of HDDs, refer to Chapter 3 “Setup of Hardware” - “Installation of Hard Disks”.

After replacement of a HDD, rebuilding will be automatically started. The table below shows when a HDD connected to Drive2 is replaced. If a HDD connected to Drive1 is replaced, the indication given by the utility and the statuses of Drive1 and Drive2 will be reversed.

Table 8.8 To have mirroring reconfiguration

	Rebuilding	After rebuilding
Utirity		

※Replacing a HDD connected to Drive2

⚠CAUTION

After checking a HDD for replacement, replace it. Replacing a normal HDD with a faulty HDD may halt and damage the system.

If rebuilding is not automatically started, refer to This Chapter “Troubleshooting”.

If rebuilding doesn’t end normally, refer to This Chapter “Troubleshooting”.

■When replaced HDD is two

Prepare two good HDDs, and after replacing two existing HDDs with them, recover it. However, regarding replacement of HDDs, refer to Chapter 3 “Setup of Hardware” - “Installation of Hard Disks”. Regarding the recovery, refer to This Chapter “OS recovery setting”.

⚠CAUTION

After setup, HDDs will be set to factory default settings, and all data on a good HDD you have prepared will be erased.

◆Hot-swap

This mirror card is hot-swapping, and while the OS is up and running, it is possible to replace a HDD. Regarding replacement of HDDs, refer to Chapter 3 “Setup of Hardware” - “Installation of Hard Disks”.

Although this function remains available if one HDD fails, it cannot be used when both HDDs are broken.

⚠CAUTION

In order to replace a HDD using the hot-swap function, always check in advance the HDD to be replaced. Removing a normal HDD with the power on and either HDD faulty may damage the system.

Two HDD is normal, and one HDD is not recommended to be detached.

OS recovery setting

This section consists of notes on OS recovery with the mirror card connected.

Usually, you should perform recovery using recovery media after connecting two HDDs to the mirror card.

If both HDDs connected to the mirror card recognize the card as normal, you can perform recovery using recovery media and bypassing the above step.

However, if two HDDs, for example, used for other RAID system are to be mirroring-configured, the mirror card may not be recognized as normal due to information on mirroring configuration.

In this case, you need to manipulate the DIP switch for the mirror card. Conduct recovery in accordance with the procedure described below.

1. Set the DIP switch for the mirror card for setting 1 with the power off.

   ※The DIP switch setteing refer to This Chapter “Switch setting” - “DIP switch”.

2. After installing the mirror card, turn on the power and check that the Access LED on the mirror card flashes orange.

   ※Check visually the mirror card LED.

   For more on the status of the mirror card LED, refer to This Chapter “Internal LED status”.

3. Turn off the power and set the DIP switch for the mirror card to normal status.

   ※How to set the DIP switch and installation/removal of the mirror card are the same as step 1 of this procedure.

4. After installing the mirror card, turn on the power and perform recovery.

   ※For more on how to perform recovery, refer to the “Windows Setup Procedure Manual” accompanying the recovery media.

FAQ・Troubleshooting

This section consists of FAQ and troubleshooting related to mirror cards. When you run into trouble, refer to the relevant items.

◆FAQ

●I am not sure in which direction the data between HDDs is copied.

・If a faulty HDD is replaced through hot-plugging, data is copied from the existing HDD to the replacement HDD.

・If a faulty HDD is replaced through cold-plugging, data is copied from the existing HDD to the replacement HDD.

●I exchanged HDDs connected to a mirror card.

・If both HDDs are normal, data is not copied.

・If either HDD is faulty, data is not copied between HDDs.

●I want to configure mirroring for an existing HDD from a backup HDD.

The backup HDD exists besides two HDDs that it is existing in the mirroring composition. When the mirroring is composed by the backup HDD, follows the following steps.

<Steps>

1. Turn off the power of PC.
2. Remove both HDDs that it is existing from the mirror card.

   Regarding removal of HDDs, refer to Chapter 3 “Setup of Hardware” - “Attaching the hard disk”.
3. Connect only a backup HDD to the mirror card.

   Regarding removal of HDDs, refer to Chapter 3 “Setup of Hardware” - “Attaching the hard disk”.
4. Turn on the power of PC.
5. Connect the HDD for which you want to configure mirroring to an empty drive attached to the mirror card and rebuild it.
6. After the rebuilding normally completes, two HDDs that is connected are mirroring composition.

◆Troubleshooting

●The OS does not boot.

・Check if switches 1 to 8 of S1 (DIP switches) are all OFF.
If not, after setting them all to OFF, turn on the power again.
・Check that the cables are properly connected.
・Check the LED on the mirror card.
If the status of the LED indicates normal, there may be a problem in the software, such as the OS.
※For more on the position and status of the LED, refer to This Chapter “Internal LED status”.

●After replacement of HDDs, rebuilding does not start.

・Check that the replacement HDD is good.
・Check the capacity of the replacement HDD.
If the capacity of the replacement HDD is smaller than that of the other HDD, it cannot be rebuilt.
In addition, even when the capacity is the same, if the make and model are different, rebuilding the HDD may not be possible due to differing specifications. Therefore, a replacement HDD must be of the same make and model as the previous HDD.
・If the replacement HDD was used in another RAID system, its configuration information may be different due when combined with the mirror card.
In that case, follows the following steps.

<Steps>

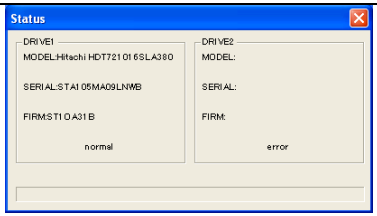
1. Set the DIP switch for the mirror card for setting 1 with the power off.
※The DIP switch setteing refer to This Chapter “Switch setting” - “DIP switch”.
2. After installing the mirror card, connect only a not replacement HDD to the mirror card and turn on the power.
3. check that the Access LED on the mirror card flashes orange.
※Check visually the mirror card LED.
For more on the status of the mirror card LED, refer to This Chapter “Internal LED status”.
4. Turn off the power and set the DIP switch for the mirror card to normal status.
※How to set the DIP switch of the mirror card are the same as step 1 of this procedure.
5. After installing the mirror card, turn on the power.
6. Connect the replaced good HDD to an empty drive attached to the mirror card and the rebuilding is started.

●Both HDDs are broken.

・Prepare two good HDDs and perform recovery.

●Rebuild failure (Read error)

A read error occurs from the source during rebuilding. Conduct restore in accordance with the procedure described below.

	Utiliry
Rebuild failure	

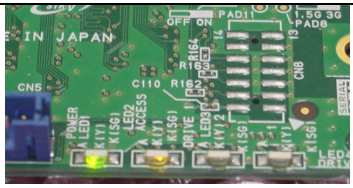
⚠CAUTION

This the restoration operation restores the error sector and not restores the data.

Because there is fear of the system may become unstable according to the data is lost, recovers optionally in accordance.

<Restoration steps>

1. Set the DIP switch for the mirror card for setting 1 with the power off.
   ※The DIP switch setteing refer to This Chapter “Switch setting” - “DIP switch”.
2. After installing the mirror card, connect only a not replacement HDD to the mirror card and turn on the power.
3. Check this status.

	Mirror card
DIP switch setting 1	 ※Refer to This Chapter “Internal LED status.

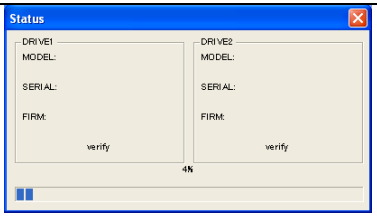
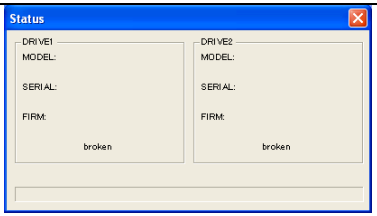
※When the DIP switch is the setting 1, can not start Windows. Not Check by utility.

4. Turn off the power and set the DIP switch for the mirror card for setting 2.

※How to set the DIP switch of the mirror card are the same as step 1 of this procedure.

5. After installing the mirror card, turn on the power and start Windows.

6. After start Windows, check this status.

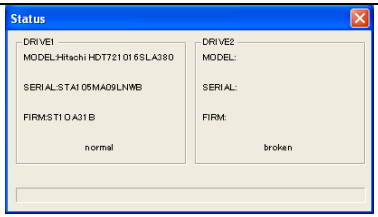
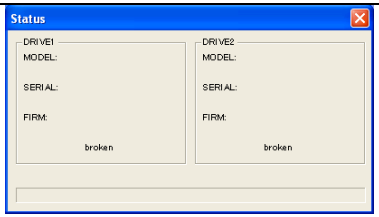
	DIP switch setting 2 running	DIP switch setting 2 completion
Utility		

7. After this step 6 completed, the restoration was completed if there is no error.

※When the error is generated, the restoration is a failure. Refer to the next item “Restoration failure”.

●Restoration failure

When the restoration of the before item “Rebuilding failure” failed, follows the following steps according to each state.

	One HDD	Two HDDs
Utility		

※The Failure of restoration doesn’t check from the mirror card LED. Check only the utility.

[One HDD]

One HDD in a mirroring-configured has the error sector that can not be restored. Replace a faulty HDD for a new HDD. After the HDD replaced, recovers it. Regarding replacement of HDDs, refer to This Chapter “RAID setup when replacing the HDD”.

[Two HDDs]

Two HDDs in a mirroring-configured has the error sector to the same sector. Follows the following steps

<Restoration steps>

1. One HDD either of two HDDs in a mirroring-configured is replaced.

   ※Regarding replacement of HDDs, refer to This Chapter “RAID setup when replacing the HDD”.

2. After the HDD replaced, the rebuilding is started.
3. After the rebuilding is completed, a read error occurs from the source. Follows the same as step 6 from 1 of the before item “Rebuilding failure”
4. After this step 3, the restoration was completed if there is no error.

   ※When the error is generated by the not replace HDD, the restoration fails. Replace that HDD for the good HDD.

   If the error doesn’t occur and the rebuilding completes, the restoration complets after that HDD is replaced the good HDD. When the error occurred, refer to before item “Rebuilding failure”.

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User's Manual

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